Book No. ....

ROYAL
COLLEGE
OF DENTAL
SURGEONS·

LIBRARY

Books may be retained for one week and may be renewed once if no application has been registered for them. For longer detention a fine of 5 cents per day will be imposed.

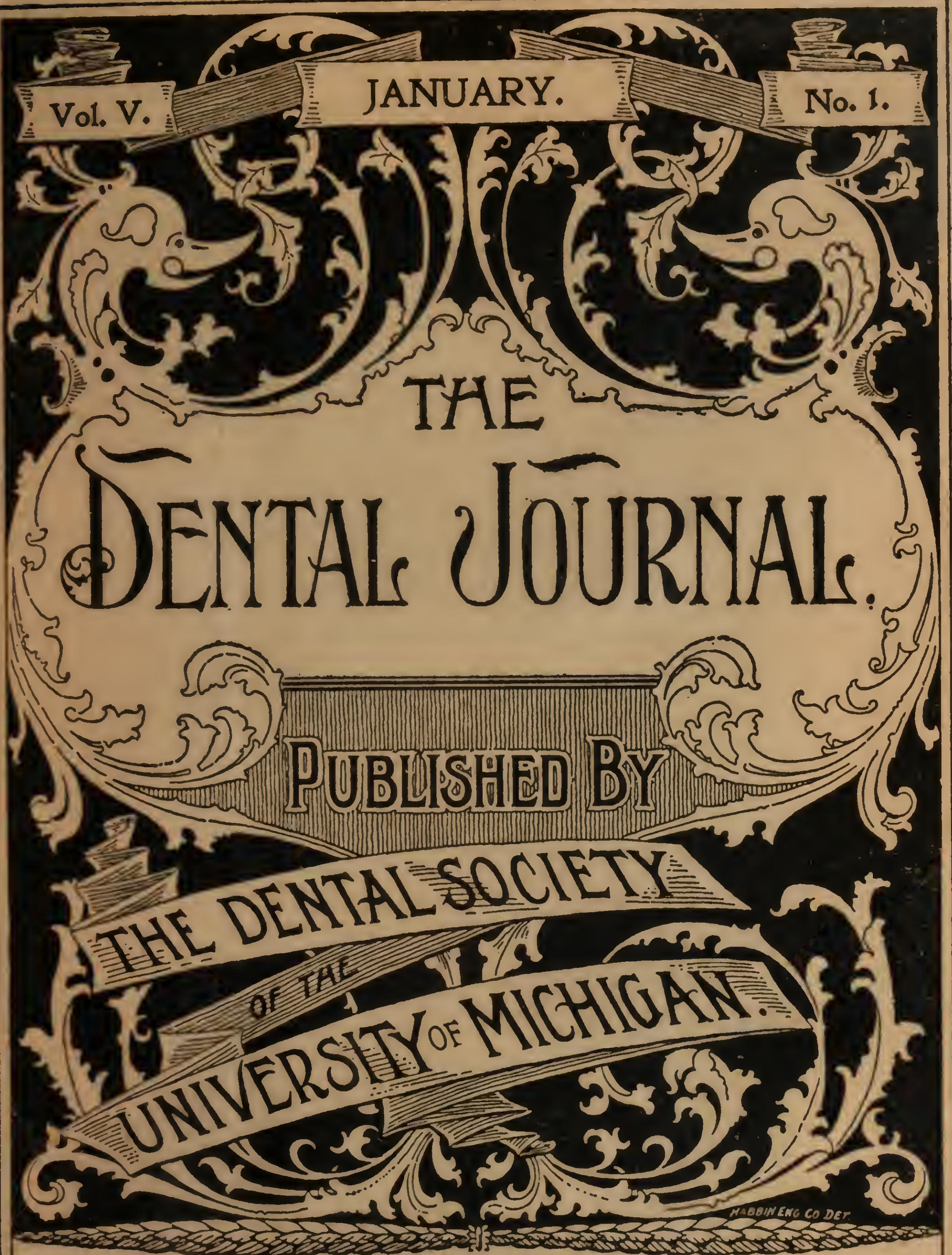
The Librarian shall examine every book returned and if the same be found marked, spotted with ink, with leaves turned down or in any way injured, the borrower shall pay the value of the book.

ROYAL COLLEGE OF
DENTAL SURGEONS OF ONTARIO

Digitized by the Internet Archive
in 2011 with funding from
University of Toronto

http://www.archive.org/details/dentaljournal05mich

Vol. V. JANUARY. No. 1.



THE DENTAL JOURNAL.

PUBLISHED BY

THE DENTAL SOCIETY OF THE UNIVERSITY OF MICHIGAN.

HABBIN ENG. CO. DET.

BOARD OF EDITORS.

CLARENCE H. BAILEY, '96, Editor in Chief.
A. W. HAIDLE, D. D. S., '92, Alumni Editor.
RALPH L. WILLIAMS, '96, Department Editor.
LESTER GEORGE, '98, Assistant Department Editor.
HARRY D. WATSON, '97, Business Manager.
S. K. SCHARLOTT, '97, Assistant Business Manager.

THE DENTAL JOURNAL.

Published bi-monthly throughout the college year, the first number appearing in January.
The subscription price is fifty cents per year, or three years for $1.00.
All communications should be addressed to The DENTAL JOURNAL, Ann Arbor, Mich.
Entered at the Postoffice at Ann Arbor as second class matter.

CONTENTS.

CONTRIBUTIONS— PAGE.

Extraction of the First Molar,............*By J. M. Thompson, D. D. S.* 1
The Use of Resorcin in Cases of Receded Gums,..*By J. W. Copeland, '96* 6
A Few Thoughts on Artificial Dentures,............*By J. W. Lyons, '96* 8
Trismus—A Case in Practice,. ....*By J. Austin Bucknall, D. D. S.* 11
Fermentative Changes in the Human Mouth,.......*By F. M. Bacon, '96* 12
The Sincere Dentist; A Public Benefactor,........*By Lester George, '98* 16
Brazilian Letter.. 19
EDITORIAL.. 20
MISCELLANY.. 24
BOOKS RECEIVED.. 26
ALUMNI NOTES.. 26
DEPARTMENT NOTES.. 28

ADVERTISEMENTS.

The Ransom & Randolph Co.,.................................... I
The Canton Surgical and Dental Chair Co.,.................................... II
H. J. Caulkins,.................................... III
The Ransom & Randolph Co.,.................................... IV
The Ransom & Randolph Co.,.................................... V
The Buffalo Dental Manufacturing Co.,.... VI
Borine Chemical Co.,.................................... VII
Ambrose Lawrence,.................................... VII
Hood & Reynolds,....................................VIII
H. J. Caulkins,.................................... IX
Lambert Pharmacal Co.,.................................... X
J. N. Ney & Co.,.................................... XI
University of Michigan,.................................... XII
The S. S. White Dental M'f'g Co.,..........................3d page cover
The S. S. White Dental M'f'g Co.,..........................4th page cover

THE DENTAL JOURNAL.

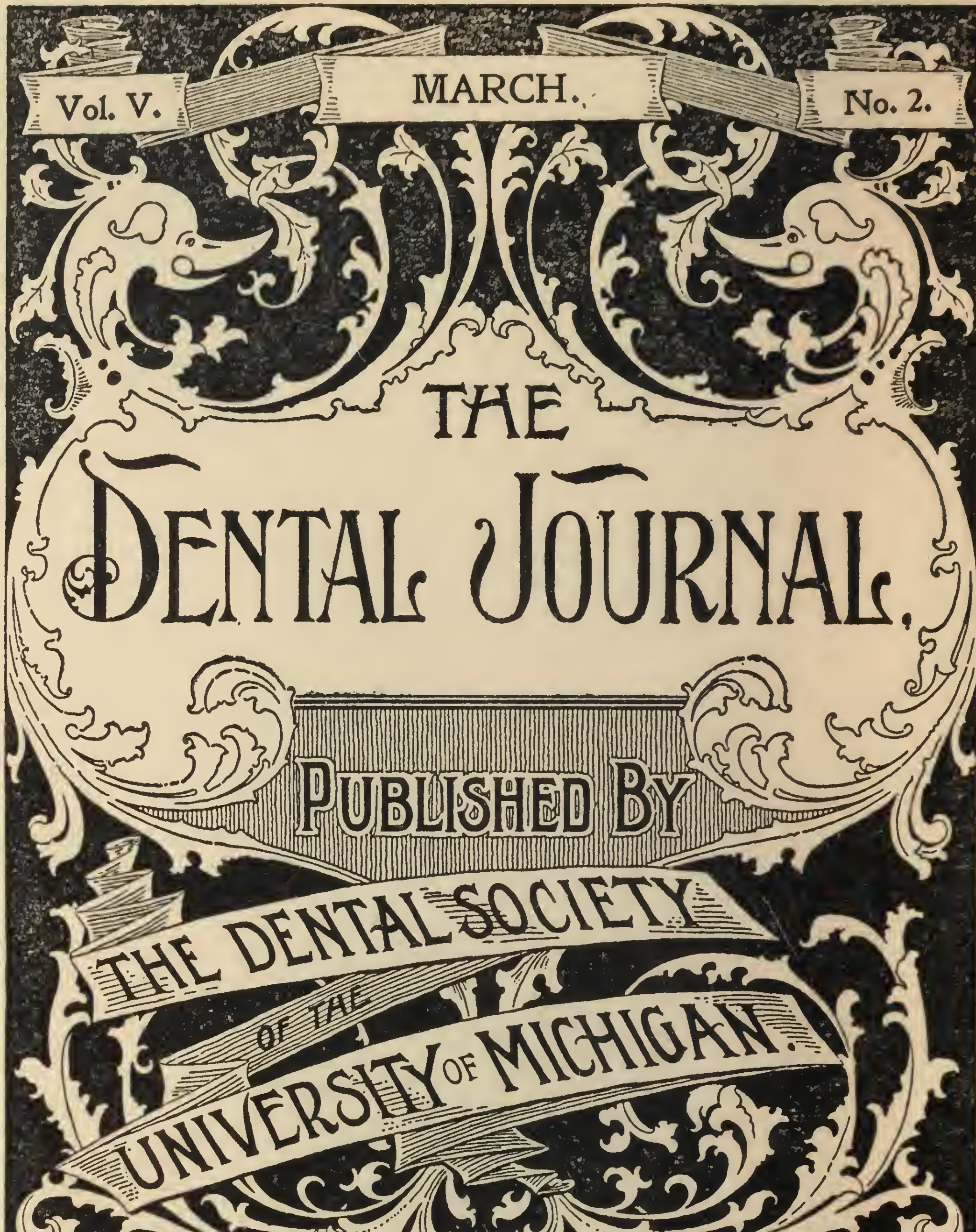
Published bi-monthly throughout the college year, the first number appearing in January.
The subscription price is fifty cents per year, or three years for $1.00.
All communications should be addressed to The Dental Journal, Ann Arbor, Mich.
Entered at the Postoffice at Ann Arbor as second class matter.

CONTENTS.

CONTRIBUTIONS— PAGE.
Exostosis . . . . *By A. W. Diack, D. D. S.* 33
Food-Stuffs: Their Relation to Dental Caries . . *By A. W. Haidle, D. D. S.* 39
Cleaning and Bleaching of Bones . . . . *By H. H. Lauderdale, D. D. S.* 43
Obtunding Agents for Sensitive Dentine . . . . *By C. H. Bailey, '96* 48
Amalgam . . . . *By Stanford James Farnum, '96* 58
CODE OF DENTAL ETHICS 46
THE LITERARY PHASE OF DENTISTRY 52
ESTABLISHING A DENTAL PRACTICE 55
EDITORIAL 62
REPORT OF THE OPERATIVE CLINIC FOR 1894–95 64
ALUMNI NOTES 65
DEPARTMENT NOTES 66

ADVERTISEMENTS.

The Ransom & Randolph Co., ... I
The Canton Surgical and Dental Chair Co., ... II
H. J. Caulkins, ... III
The Ransom & Randolph Co., ... IV
The Ransom & Randolph Co., ... V
The Buffalo Dental Manufacturing Co., ... VI
Borine Chemical Co., ... VII
Ambrose Lawrence, ... VII
Hood & Reynolds, ... VIII
H. J. Caulkins, ... IX
Hood & Reynolds X
Lambert Pharmacal Co., ... XI
J. N. Ney & Co., ... XII
The S. S. White Dental M'f'g Co., ... 3d page cover
The S. S. White Dental M'f'g Co., ... 4th page cover


HABBIN ENG CO DET.

Vol. V. MARCH. No. 2.

THE DENTAL JOURNAL.

PUBLISHED BY
THE DENTAL SOCIETY
OF THE
UNIVERSITY OF MICHIGAN.

BOARD OF EDITORS.

CLARENCE H. BAILEY, '96, Editor in Chief.
A. W. HAIDLE, D. D. S., '92, Alumni Editor.
RALPH L. WILLIAMS, '96, Department Editor.
LESTER GEORGE, '98, Assistant Department Editor.
HARRY D. WATSON, '97, Business Manager.
S. K. SCHARLOTT, '97, Assistant Business Manager.

THE DENTAL JOURNAL.

Published bi-monthly throughout the college year, the first number appearing in January.
The subscription price is fifty cents per year, or three years for $1.00.
All communications should be addressed to The Dental Journal, Ann Arbor, Mich.
Entered at the Postoffice at Ann Arbor as second class matter.

CONTENTS.

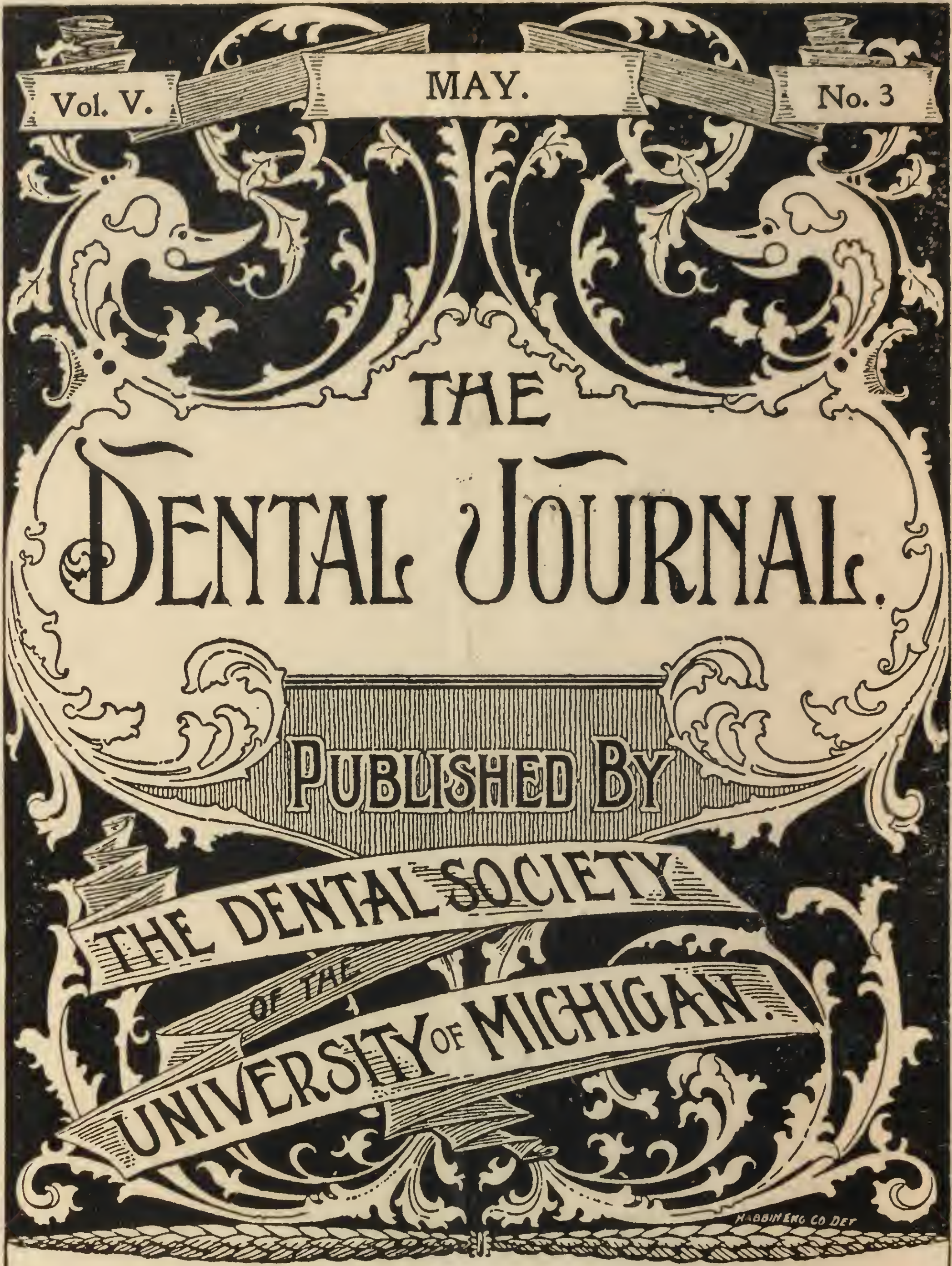
CONTRIBUTIONS—

PAGE.
Hæmophilia, *By J. H. Neeley, D. D. S.* 72
Dentistry in the United States, *By C. A. Quackenbush, '96* 74
Fracture and Treatment of Inferior Maxillary, *By F. E. Logan, '96* 77
Chlorate of Potash as an Antiseptic *By P. G. Unna* 81
Guaiacocaine Cataphoresis: Outfit and Technique, *By William James Morton, M. D.* 83
EDITORIAL 87
DENTAL LAW IN CANADA 89
MICHIGAN STATE BOARD OF EXAMINERS 90
MICHIGAN DENTAL ASSOCIATION 90
THE NEW CALENDAR 91
BOOKS RECEIVED 91
ALUMNI NOTES 91
DEPARTMENT NOTES 93

ADVERTISEMENTS.

The Ransom & Randolph Co., I
L. D. Caulk II
The Canton Surgical and Dental Chair Co., III
H. J. Caulkins, IV
The Ransom & Randolph Co., V
The Ransom & Randolph Co., VI
The Buffalo Dental Manufacturing Co., VII
Roberts & Lathrop VIII
Roberts & Lathrop IX
Borine Chemical Co., X
Ambrose Lawrence, X
Hood & Reynolds, XI
H. J. Caulkins, XII
Hood & Reynolds XIII
Calkins' Pharmacy XIV
Lambert Pharmacal Co., XV
J. M. Ney & Co., XVI
The S. S. White Dental M'f'g Co., 3d page cover
The S. S. White Dental M'f'g Co., 4th page cover

Return to WG [illegible]



Vol. V. MAY. No. 3

THE DENTAL JOURNAL.

PUBLISHED BY THE DENTAL SOCIETY OF THE UNIVERSITY OF MICHIGAN.

BOARD OF EDITORS.

CLARENCE H. BAILEY, '96, Editor in Chief.

A. W. HAIDLE, D. D. S., '92, Alumni Editor.

RALPH L. WILLIAMS, '96, Department Editor.

LESTER GEORGE, '98, Assistant Department Editor.

HARRY D. WATSON, '97, Business Manager.

S. K. SCHARLOTT, '97, Assistant Business Manager.

THE DENTAL JOURNAL.

Published bi-monthly throughout the college year, the first number appearing in January.
The subscription price is fifty cents per year, or three years for $1.00.
All communications should be addressed to The DENTAL JOURNAL, Ann Arbor, Mich.
Entered at the Postoffice at Ann Arbor as second class matter.

CONTENTS.

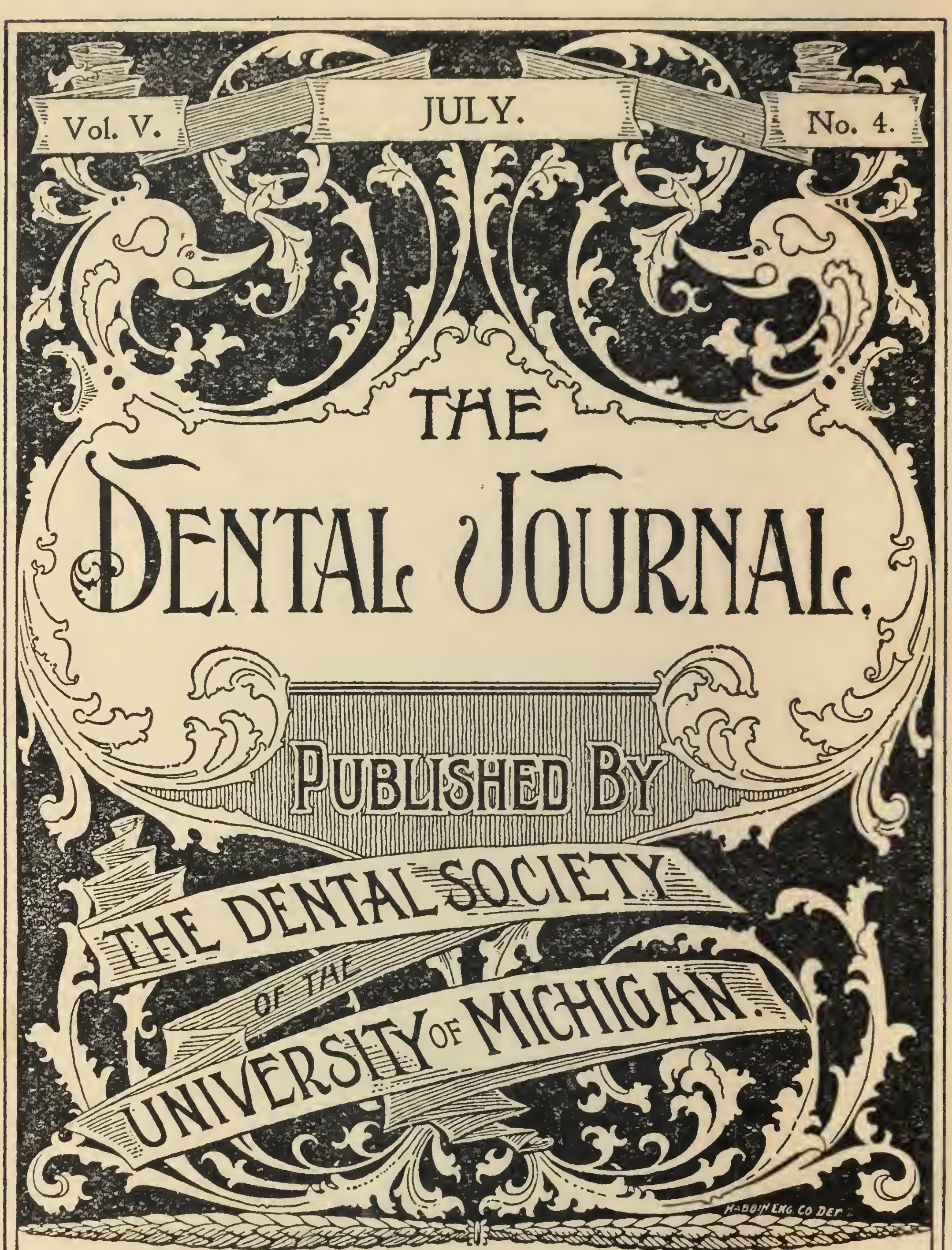
CONTRIBUTIONS— PAGE

Impression Materials, and how to use them to Attain the Best Results, *By C. A. Devlin, '96* 95
Some Recollections of the Class of '96............ *By H. Hillman, '96* 104
Galvanic Action between Gold and the Base Metals used for Filling Teeth, *By J. P. Collett, B. S., '96* 108
Tin Foil.......................... *By Stanley Ammon Farnum, '96* 114

EDITORIAL.. 116
DENTAL SOCIETY MEETINGS.................................. 118
DENTAL COLLEGE FEES...................................... 120
NOTICES.. 120
ALUMNI NOTES... 121
A SUMMER SCHOOL.. 122
MICHIGAN STATE BOARD OF DENTAL EXAMINERS................. 123
REPORT OF CLINICS.. 124
LIST OF GRADUATES.. 125
DEPARTMENT NOTES... 126

ADVERTISEMENTS.

The Ransom & Randolph Co.,.................... I
L. D. Caulk................................... II
The Canton Surgical and Dental Chair Co.,..... III
H. J. Caulkins,............................... IV
The Ransom & Randolph Co.,.................... V
The Ransom & Randolph Co.,.................... VI
The Buffalo Dental Manufacturing Co.,......... VII
Roberts & Lathrop............................. VIII
Roberts & Lathrop............................. IX
Borine Chemical Co.,.......................... X
Ambrose Lawrence,............................. X
Hood & Reynolds,.............................. XI
H. J. Caulkins,............................... XII
Calkins' Pharmacy............................. XIII
Lambert Pharmacal Co.,........................ XIV
J. M. Ney & Co.,.............................. XV
The S. S. White Dental M'f'g Co.,............. 3d page cover
The S. S. White Dental M'f'g Co.,............. 4th page cover


HABBIN ENG. CO DET.

Vol. V. JULY. No. 4.

THE DENTAL JOURNAL.

PUBLISHED BY

THE DENTAL SOCIETY OF THE UNIVERSITY OF MICHIGAN.

BOARD OF EDITORS.

CLARENCE H. BAILEY, '96, Editor in Chief.

A. W. HAIDLE, D. D. S., '92, Alumni Editor.

RALPH L. WILLIAMS, '96, Department Editor.

LESTER GEORGE, '98, Assistant Department Editor.

HARRY D. WATSON, '97, Business Manager.

S. K. SCHARLOTT, '97, Assistant Business Manager.

THE DENTAL JOURNAL.

Published Under the Auspices of the Dental Society of the University of Michigan.

VOL. V. JANUARY 1, 1896. NO. 1.

EXTRACTION OF THE FIRST MOLAR.*

BY J. M. THOMPSON, D. D. S.

THIS subject is so closely related to that of Orthodontia that it is indeed really a part of that very interesting study.

In looking into the history of different nations, we find that we, as Americans, having descended from a mixed parentage, are a race endowed with inferior organs of mastication. Civilization has brought many types of people together, and while in other countries races intermingle to a certain extent, the United States leads the world in this respect.

A study of comparative anatomy will show what efforts nature has to put forth to produce harmony of the parts, in children born of mixed parentage. The large bones of the skull of the father transmitted to combine with the small facial bones of the mother produce irregularities which are hard to overcome.

The same rule applies to the teeth. The large teeth of the father are accompanied by the small jaws of the mother, and also the opposite condition. It is owing to these conditions that there is such a prevalence of deformities.

The temporary teeth of the children of to-day seem inferior to those of past generations. As a rule they are neglected and the process of decay attacks the first molar, before it is noticed, and results in its loss.

There are rules governing the extraction of all teeth which must be given consideration. The removal of any tooth should be attended with a perfect knowledge of the circumstances and conditions which have made such an operation necessary. Teeth should never be condemned until every doubt of their utter worthlessness has been removed.

---

* Read before the Detroit Dental Society, November 9, 1895.

An error in judgment has caused many an operator to have visions of deformed faces and arches pass before him daily.

The wholesale destruction of the first permanent molar excites inquiry as to the causes and consequences of such a loss. This molar is the largest tooth in the mouth and is called by some the link between the first and second dentition. Its early eruption (which in some cases is at four and one-half years) gives to the permanent set a poorly constructed member, its crown being covered with inferior enamel, and the dentine lacking in substance and stability.

Fissures caused by the failure of the enamel plates to unite form resting places for food and invite decay. Other influences also hasten the breaking-down process, and these, crowned with the culpable ignorance on the part of parents, fill our offices with little patients suffering for the sins of the guilty.

In our efforts to educate our patients regarding children's teeth, too much stress cannot be put upon the facts relating to the eruption of the first molar, and that it is not, as is commonly supposed, a temporary tooth.

Tables showing the relativity of decay tell us that this molar is the first to be affected with caries. It therefore becomes necessary to watch its eruption carefully, and to do all in our power to preserve it. The period of its usefulness is between the time of its appearance and the eruption of the second permanent molar, as during this time it is the principal organ of mastication.

Its loss, with that of the temporary molars, throws the work of mastication upon the anterior teeth. This causes enlargement of the jaws, and usually a protrusion of the lower, giving the face anything but a desirable appearance, and some authors call it an apish or bull-dog face.

The jaws back of the bicuspids (owing to its absence) are necessarily weak from lack of nutrition and use. A general derangement of the digestive organs may also be caused by the lack of proper mastication of food. There is no better method of estimating the probable duration or life of a tooth than to remember the general rule that the time required for its development and growth may be considered as usually proportionate to that of its existence.

Another argument or law may also be considered, that the extraction of poorly formed teeth is often followed by a very marked improvement in the quality of the remaining ones, reducing the amount of tissue to be nourished, and giving an extra supply to that which is left.

Among the many arguments against the extraction of this tooth is the fact that its loss means a consequent shortening of the bite; this permits the erupting lower incisors to strike with increasing force against the upper, causing them to move forward. This is directly attributed to the decided difference in length of the deciduous and permanent incisors, the forward movement of the permanent being a natural consequence from lack of room. A gradual change in the position of all the teeth may result as well.

A point in favor of preserving the first molar is that it acts as a partial support to the crowns of the deciduous molars, thus aiding them in maintaining their stability, until they have fulfilled their natural functions. If this is done, a two-fold benefit has been derived, as at the time of the natural loosening of the deciduous crowns, the bicuspids are ready to soon take their places, and they, too, have been helped.

A premature extraction of this tooth allows the germs of the bicuspids to drift backward and causes the teeth to be erupted back of their natural positions. The second bicuspid is inclined backward, thus greatly interfering with its use as an organ of mastication.

The second permanent molar generally tilts forward and a V-shaped space between the two is a result. Food lodging in this space is very hard to remove, and causes decay. Operations upon the proximate surfaces of these teeth are very difficult.

If extraction becomes necessary from an over-crowded condition of the arch, the best time to operate is indicated by each individual case. It is best, however, to remove the molar at or before the time for the eruption of the second molar.

The incoming tooth will generally move forward and occupy the space without altering its upright position. It is well, if one of the teeth is defective and it has been decided that all four must be extracted, to preserve, if possible, the faulty one, and then remove all at the same time. The extraction of the entire four prevents the one-sided appearance so often found.

If the operation is delayed until after the second molar is in place it is well to await the appearance of the third molar, which will crowd the second molar into the place of the first molar.

The whole subject may be summed up by stating that nature has given to man two sets of teeth, and that each should consist of twenty and thirty-two respectively.

Any departure from this is an abnormality, and it is our duty to maintain the normal as far as possible. But, as the horticulturists use their pruning knives for the best good of their plants and vines, so must we, as dentists, remove unpromising dental organs, that those which are to remain shall be of the best possible quality.

DISCUSSION.

Dr. N. S. Hoff: The assertion made by the essayist that the teeth of the people of this country are inferior in quality to those of peoples in other countries I am inclined to deny. I am too loyal an American to countenance such an assertion and firmly believe we have as good teeth as the people of any civilized country.

Regarding, however, the extraction of the first molar, I must say that I am decidedly opposed to its indiscriminate removal. In the majority of cases there results not only an unsightly space between the second bicuspid and second molar, and an imperfect articulation, but there is a strong tendency to a lack of development in length of the inferior maxillary.

In a careful examination of 304 cases of articulated plaster models, made from plaster impressions by the students of the University of Michigan, and representing the dentures of the students themselves, I found eighty cases which have a direct bearing on this question. Of these, fifty-six cases show a decidedly faulty articulation, while twenty-four show fairly good results. I have with me a number of these models, chosen impartially and illustrating both sides of the question, which I shall be pleased to have you examine. To me they show conclusively that extraction of the first molar can rarely, if ever, be done without resulting in some deformity, either facial or in articulation.

Dr. J. A. Watling: To me it is simply a question as to the time at which the first molar can be extracted with the best results. Frequently dentists will insert an amalgam filling into a badly decayed molar with the expectation of saving it for a few years. This is all wrong. In ninety-nine of every hundred cases, if this tooth is extracted at the age of ten or eleven years, the second molar will come in and occupy a good, upright position; will nearly, or quite, fill up the space left by the first molar, and both second and third molar teeth will be the better for it. On the other hand, if left in, you will usually lose not only the first molar, but perhaps the second, and are quite certain to have bad decay of both second bicuspid and second molar. In the upper jaw we have even better results than in the lower.

In my own mouth all of the first molars have been removed and the others are still in good condition. I contend that if they must be lost before the age of twenty-five, they should be taken out at the age of ten or twelve years, and thus insure having good second and third molars.

I have here a boy whose mouth I wish you to examine. All of the first molars were removed by me when he was ten years of age. He is now twelve and I am certain you will bear me out in the assertion that the results are good.

Dr. W. H. Dorrance: There is not sufficient time remaining for a full discussion of this subject, but this much I will say, that, in general, no tooth should be extracted until an absolute necessity exists for such an operation. I have noticed that exostosis occurs very frequently where there is mal-occlusion of the teeth, and mal-occlusion is certain to occur where a molar has been extracted.

Dr. E. C. Moore: The models shown by Dr. Hoff are to me valueless as proofs of anything detrimental to the extraction of the first molar. There is no evidence of the conditions present at the time of extraction.

Dr. J. Lathrop, Sr.: Even the most badly decayed molar, when capped with a shell crown, will last indefinitely, provided always that the roots are in good condition. I strongly object to the extraction of any tooth until it becomes absolutely necessary, especially in the case of children.

THE USE OF RESORCIN IN CASES OF RECEDED GUMS.*

BY I. W. COPELAND, '96.

THE drug of which I am going to speak to-night, and the use to which I put it, has served me a very good purpose, and will you, if properly used.

Have you ever seen a patient with an accumulation of salivary calculus on the labial surfaces of the lower incisors and cuspids, but more often on the centrals alone, which had irritated the gums to such a degree that they had receded to quite an extent, leaving the teeth loose in their sockets?

I do not aim to apply this treatment to receded gums all over the mouth, but simply to the conditions I have stated.

This drug, resorcin, is comparatively little known, and less so in the use to which I put it. Not that I claim anything original in the use of it. I found a small article in some work about a year ago, and that led me to experiment. Resorcin, as it comes to us, is in the form of fine grayish crystals, freely soluble in water or alcohol. It is similar to carbolic acid in formula, phenol, as you know, having the formula $C_6H_5\,OH$, while in resorcin we have one of the hydrogen atoms replaced by one of hydroxyl, giving the formula $C_6H_4(OH)_2$. It is equally powerful as a germicide as carbolic acid, while it has very little, if any, of its irritating effects. If injected into mucous membrane it will neither produce inflammation nor abscess, but will vesicate it.

Dr. Hoff tells us there are two methods of using drugs: The empirical, in which we use a drug, the action of which is not known, to get certain results; and the rational, the more satisfactory, in which we use a drug whose properties and action are known to produce definite effects in accordance with these properties. It is on this latter method we base our use of resorcin.

The first thing to do in an operation of this kind is to remove every particle of salivary calculus from the teeth, being careful not to scratch or mar their surfaces, and to injure the gums as little as possible. Then take a piece of muslin, cottonoid, or similar material of convenient size, and place under the tongue to keep the saliva from flowing over and between the teeth. This will have to be renewed quite frequently during the operation, as any irritation in this locality causes a great flow of saliva. As we are to operate on a sensitive tissue, we must use some form of local anesthetic, and I hardly think it advisable to use any form of hypodermic preparation on account of wounding the gums unnecessarily. Any of the stronger solutions of cocain, or other topical applications are useful, but the following seems to meet these requirements very well indeed: Mix together one ounce each of chloroform, alcohol, and tincture aconite and add eight grains of morphine which has first been dissolved in the least possible quantity of water, preferably hot. Now with our lance we make circular incisions near the gum margin, or about one-sixteenth of an inch below it. Wiping off as much of the blood as possible, we apply a little of the resorcin on cotton and find the bleeding almost immediately checked, owing to the strong styptic qualities of the drug. Then securing as much dryness as possible, with a cement spatula or other suitable instrument pack the incisions with resorcin. Caution the patient about too severe brushing of the teeth in that region for a few days, and the operation is complete.

---

*Read before the Dental Society, November 4, 1895.

The next day we find very little soreness in the gums. That is one of the virtues of this treatment. But the wound is distended through the action of the drug on the mucous membrane. This gaping of the wound necessarily raises the edge of the gum a little. In a very short time we find the wound filled in with granular tissue and quite a marked improvement in the conditions. The tooth is tighter, the gum adhering more closely to it and not having that puffy, inflamed appearance which it had at the time of the first operation. If in two or three weeks we think we can further benefit the patient by another operation, the process is exactly the same, being careful to have the incision just below the cicatrix left by the preceding operation. Sometimes by several operations of this kind we are enabled to raise the margin of the gum very perceptibly, thereby saving a tooth for several years that otherwise would have to be removed in a comparatively short time.

Do not be discouraged if the first time you use it you can not see any very decided results, for by continued use you will become better acquainted with its application, and will be able to see some marked improvements brought about by its use.

A FEW THOUGHTS ON ARTIFICIAL DENTURES.*

BY J. W. LYONS, '96.

I HAVE been asked the question by dentists of years of practice why it was that in nearly all cases the young dentist just from college disliked to do plate work so much and was so thoroughly filled with the desire for operating. I have heard students express themselves that when they took up their own practice they were going to do just as little plate work as possible. In the majority of practices which we will acquire I am inclined to believe we will be called upon to practice this branch of dentistry quite extensively. In every office there is a certain amount of plate work to do and in the finer practices, where the least amount of plate work is to be done, it is all the more important that we make every piece a masterpiece, and therefore a most thorough study of this branch of dentistry is required. I am confident that we will never insert a denture, if we are wont to study, but that we will learn a great deal from all the conditions attending it. I believe much of our success as practical dentists will lie in our ability to construct successful dentures. I am afraid many of us do not fully appreciate the vast importance of this and do not grasp every opportunity and point of assistance until thrown upon our own resources, when we will fully realize our weakness in this branch of dentistry. I believe that of all that constitutes dentistry the mechanical forms the basis. And to make any thing that is beautiful in our art, especially in vieing with nature in matching the teeth, we must be more than mere mechanics, more than capable of filling a tooth or treating an abscess; we must be dental artists.

It is not enough that we fit the plate accurately to the gums; that we grind the teeth so that the joints may be water tight; that we make every joint so it cannot be distinguished; that we polish the plate till not the slightest scratch could be found nor the tongue find the least fault. We have much to do besides.

---

* Read before the Dental Society, November 18, 1895.

Upon our skill, assisted by the laws of mechanics and geometry and the beauties of art, lies the expression we are to lend to the face. We must impart action to them. We must instil life therein or our labors are in vain. If the tooth lacks the proper color and shape, or is unskillfully set in the arch for the person it is intended, it is a failure.

It is a noticeable fact that with a large proportion of people the appearance of an artificial denture is the subject of more solicitude than the difficulty to be experienced in masticating or the prospect of trouble in wearing, and I have even known of cases where patients could not use them in mastication, but would wear them between meals. Bearing this in mind it is surprising with what utter disregard of the rules of expression so large a number of artificial dentures are constructed and are only fit to be termed "false teeth."

Among the prominent failures in the expression that I judge some of us will experience is that of: First, color; by which they are often detected at once. Second, length. Third, size of the teeth. Fourth, deficiency of form of each individual tooth. Fifth, want of prominence and of length of cuspid teeth. Sixth, too great length of molars and bicuspids, especially above. Seventh, too much evenness or similarity. Eighth, size of arch. Ninth, line of articulation may be too straight. It is said with some practitioners the same unvarying form is followed in the arrangement of teeth, leaving only the shade and size to be determined by the requirements of the case, while some even ignore all discrimination in these particulars and insert teeth of the same size, shade and form in each and every instance. The shade and size of teeth may be advantageously studied in connection with the subject of temperament. With patients in whom the bilious type prevails we shall find required the dark or bluish tint and long narrow shape, not so strongly marked in the latter particular, however, as in the purely nervous temperament, where the teeth are almost invariably narrow, whether dark or light in shade. Where the sanguine temperament predominates the length should be less marked in relation to the width and the shade should approximate to white, with a yellowish tinge. The lymphatic patient usually requires a short, broad tooth, though rarely approaching the shape of those of the sanguine temperament; the color should be white or of a chalky appearance.

The arrangement of the teeth forms a very important part which necessitates the study of the conditions thoroughly and should be arranged much the same as the natural ones were, unless the natural teeth were irregular or over-crowded in the arch, which would necessitate a change or variation from that form.

Upon the lateral incisors and cuspids depend much of the expression which is given to the face. In many cases the too great projection of the bicuspids tends to increase artificial appearance, but the twist given to the cuspid will remedy this. We should bear in mind that the teeth appear whiter when placed in the mouth, from their contrast with the red color of the lips and the darkness of the mouth generally. Lady patients, especially, are prone to desire teeth of a much lighter shade than natural expression would possibly admit. By yielding to their wishes many times we will in the end do ourselves more injury than by following the dictates of our own judgment at the risk of incurring their temporary displeasure.

The hygenic relations: In view of the various pathological conditions existing from the wearing of artificial dentures it is of the greatest importance that the highly injurious influences which such appliances often exert should be recognized and eliminated as fully as possible. We find under this head two classes of disturbances, local and systemic. Under the first by far the greater number of morbid phenomena exist, although instances of marked constitutional disturbances have been traced to the wearing of artificial dentures where, by reason of mal-adaptation or of unsuitable material used in construction, it has set up and maintained an amount of local irritation sufficient to produce unmistakable systemic derangement. It should be borne in mind in all instances that in inserting an artificial denture of whatever character a foreign body is introduced into the oral cavity which, under certain conditions, may act in greater or less degree as an irritant to the tissues or organs with which it comes in contact; hence a careful study should be made of all the phases in each case, so that the irritant action may be reduced to a minimum.

Want of proper adaptation may become a source of inflammation productive of an amount of morbid activity varying in degree from a simple reddening and chronic inflammation of the tissues without hypertrophy, to the production of malignant growths. Rough surfaces, projecting edges or points, or unequally distributed pressure upon different portions of the hard palate are causes for irritation which may result in inflammatory action, either acute or chronic, causing, in many cases, a rapid absorption of underlying osseous tissues with hypertrophy of mucous membrane, or may cause suppuration and abscess with sloughing of soft parts. Dyspepsia and other systemic disorders may be the result of an ill-fitting denture because of the patient not being able to masticate properly. Lack of cleanliness on the part of the patient may result in highly inflamed underlying mucous membrane, causing in time very badly diseased tissues.

TRISMUS.—A CASE IN PRACTICE.

BY J. AUSTIN BUCKNALL, D.D.S., DETROIT.

Mrs. —— was sent to me on the 25th of September to obtain relief from a closed jaw.

The opening being insufficient for more than the finger, cold applications in the form of a bandage over the affected parts were tried. This proved of no avail, for in three days or so the tonsils gave trouble and quinsy set in. It is a well known fact that quinsy will contract the muscles of mastication partly, if not entirely, the inflammatory process passing to the tissues immediately surrounding the maxillary articulation; the glands, even the cervical, becoming swollen and painful to the touch. Erysipelas, too, of the fauces and pharynx may cause temporary paralysis of these muscles. After the quinsy had broken, and it being equally certain that there was no erysipelas, while the closure still continued, trismus was given the credit for the trouble. This may happen temporarily from contraction of the muscles of mastication, especially the masseter, due to irritation from an uncut third molar tooth, pressure being exerted on the neighboring structures for want of room between the second molar and the ramus of the jaw; tonic spasm of the internal pterygoid and masseter resulting. Torticollis and paralysis of the muscles of the arm and hand have been known to result from this, relief being obtained by extraction. In this case, however, there was apparently little inflammation. The first and second molars of the lower jaw were all in fragments, while both lower third molars were apparently fully erupted. The upper jaw was minus a molar on each side and the third molars were both erupted, no pressure being exerted on the lower third molars. Several attempts to open the lower jaw sufficiently for extraction were made, but without success, until it was finally decided to give chloroform and remove all carious roots and the two lower third molars, as, from their proximity to nerve trunks, relief might be obtained. This was done on the 19th of October, a number of fragments being removed. One of the latter was unusually large and had a large cavity on the posterior surface, while one root was arrested in development on one side, the apex being much curved outwards, but the foramen well open. The desired result was slow in coming, trismus passing off only very gradually, but at the present time two fingers can be placed where a pencil had to be forced the day of the operation.

The impression may be gained by some that extraction would always be necessary. This is not so. Removal of flaps over the third molar or proper treatment of the exposed nerves in the first or second molars when badly decayed may suffice. Again, the most decayed molar might be extracted as an experiment, to obtain relief, rather than the third molar. Examination of an upper third molar might show cause as pressing unduly below.

As an interesting episode and to show an ordinary case, the assistant in my office developed trismus necessitating the extraction of a newly erupted lower right third molar, relief being apparent in a short time.

FERMENTATIVE CHANGES IN THE HUMAN MOUTH.*

BY F. M. BACON, '96.

In this age there no longer remains any line of work in which Nature does not throw open in her mysterious way the most wonderful avenues of revelation to the careful observer and thinker. This is true, not only in our every day walks of life, in connection with the smallest things, but of the professional man, the man of letters and of science. Nay, how truly is this illustrated in the specialist! For not only are these wonders revealed to him, but by unceasing inquiry he is able to make himself familiar with the details and causes of these phenomena. It therefore behooves us to exert every energy to do our work so well in our own immediate line that we shall be a credit to our fellow-men, and that a rising generation shall, in the harvest time, reap the golden fruit of our knowledge. In order that such an end may be attained, our attention must not only rest with the mere glimmer of the surface, of our every day mechanical work and a few thoughts and theories from books whose practicable side we doubt, but we shall have to dive below to procure the precious gem, original research.

---

*Read before the Dental Society, November 18, 1895.

Methinks you say that so formidable an opening means the discussion to follow is made up of original thoughts and experiments. So let me lay aside the shadow of a doubt, if there be any. This subject, as you know, is widely treated, and it is only from past research I desire to gather such a rude outline of the work as you have permitted me to present to you to-night.

The apparatus which has been used for the work in hand, so far as I shall take you, is indeed quite simple.

1. A double-walled incubator with a gas regulator.
2. Koch sterilizer.
3. Damp chambers.
4. Drying oven for sterilizing instruments at 150°.
5. Good microscope.

Of course it will be understood that an apparatus was necessary for making chemical analyses of the products of fermentation. It may also be well emphasized that all instruments were thoroughly sterilized by putting into the flame of a Bunsen burner, or, when it was impossible to do this, they were placed in a dry oven for fifteen minutes at 150–160°. It may also be of interest to note the media employed for cultures, though this has been very strongly impressed upon us on previous occasions, sterilized saliva, sugar, starch, milk, and a decoction of malt.

I will now give a few fundamental experiments from Dr. Miller, of Berlin, which have been employed with the end in view of obtaining the actions and results or certain germs, at the same time learning something of their habitat.

Experiment I.—Saliva is mixed with sugar and starch, 1–40 parts, and kept at blood temperature. This invariably becomes acid in four or five hours. But some one, no doubt, will say that this is a result of no consequence because the experiment was not made in the oral cavity.

To overcome this, and prove that the acid was the same in either case, a test-tube filled with starch was fastened to a molar tooth upon retiring. The next morning the contents of the tube were acid as before. Now the question may be raised: Does the ferment exist in the starch or in the saliva?

In order to prove this in a satisfactory manner the mixture of starch and saliva was reduced to 100° C for half an hour. After being placed in an incubator for a number of hours it was found not to have become sour. Now again the starch is heated to 150° before mixing with the saliva, and in this case the solution becomes acid. We may safely say that the ferment is in the saliva and not in the starch.

I shall now take the liberty of presenting to you three experiments from Miller's works:

Experiment I.—Each of thirty small test-tubes was furnished with eight drops of a solution of saliva and starch sterilized; each of thirty other tubes was filled with eight drops of a decoction of malt and sugar sterilized. Twenty-four were then infected from the mouth; twenty-four infected from carious dentine and twelve remained pure.

Experiment II.—In this case Miller made a solution of fifty parts of saliva and one of starch. He put equal portions into two flasks, A and B, and covered the surface of the solution in A with a layer of pure oil to prevent free access of air. The quantity of acid in A will be the same as in B. From this it was seen the fungus in question was independent of the free access of the air for its growth and development. This conclusion, of course, at once excludes the mycoderma aceti. Now the fact of developing the fungus in the absence of oxygen is of the greatest importance, since it must be dealing in a direct manner with these germs of dental caries whose life and growth is deep down in the dental tubules and tooth structure where there is no air.

A final interesting experiment was conducted in this manner: Fresh saliva was mixed with starch and placed into an incubator. The oral cavity was cleansed with pure water, tooth brush and floss, in order to free the mouth as far as possible from all microörganisms. After the cleansing operation the saliva is again obtained, mixed with starch, and upon standing in an incubator for a length of time equal to that in the first instance it is found that there will be scarcely one-fourth as much acid produced. This proves that by frequent cleansing the greater portion of the fungi are removed and consequently less acid appears. In the latter experiments microscopic examinations revealed always the presence of a fungus and this usually in the form of diplococci, either single or in chains, often in the form of bacteria, bacilli or even threads. These forms, it is stated, are frequently upon a single thread, which is characteristic of Leptothrix bacillus, these forms depending, of course, upon the media and age of culture. It has also been found that the acid production of the fungi of this class was not apparent at all times, but depended upon the media. In short, this acid condition occurs only upon carbohydrate material. From this we conclude that we have germs agreeing with the bacteria acidi lactici, which grow upon carbohydrate materials in the absence of oxygen and produce acid. Hence we have no other than the fungus of lactic acid to deal with, which Miller has, however, chosen to prove by further experiments.

We have, from the above experiments then, studied the means of obtaining access to the micro-organisms of the mouth. We have determined the principle fungus incident to caries as that of the fungus of lactic acid. Let us now watch the effects of this kind of fungus upon the tooth substance. The saliva at the best, especially in the mouths of uncleanly persons, is impregnated with sugar taken directly or by the action of ptyalin on starch. This accumulation of sugar becomes fixed between the teeth and in the fissures, necessarily becoming acid as we have before seen. As the dentine becomes decalcified it acts as a sponge, taking up the liquids and fungi of the mouth. New layers of softened dentine are continually being broken, the germs ever following deeper and deeper until the organic and inorganic structure are lost.

We have thus far studied the effects of one class of germs. It must be kept in mind, however, that there are many other varieties. For the purpose of studying these classes the outer layers of dentine are found most excellent, for the reason that many germs here found require plenty of oxygen to live. Pure cultures are made and are found to consist of cocci or diplococci, single or in chains, and, for the most part, without motion. So far, investigation has failed to detect spore-producing bacteria. The involuted forms present characteristic appearances. We find quite often that the protoplasm contains granules, and sometimes there is found about the germs a gelatinous sheath.

Miller has demonstrated that if one takes a large number of these cultures there is found a second fungus differing in many respects from the one just described. This fungus occurs chiefly in bacilli, diplococci, etc.

For some time before this, the fact that in dentinal tubules would be found transitory forms, leptothrix to bacillus, bacillus to bacteria, and so to cocci, was not believed, though the fact was adhered to by many men of science. But by the discovery of fungi the fact has been clearly demonstrated, and, as Miller says, "those who maintain that such cases may not be found are responsible for their own mistake."

We have, then, two definite forms of fungi. The one always, and the other probably, present. The first fungus we know produces lactic acid, and the second fungus undoubtedly, though the acid in the latter case is always produced in the presence of the former fungus. These microörganisms require sugar of some form to work upon. The fermentation is most active at 35°–40° with no production over 50° or under 15°. In addition to these we find many other forms, and still others to be worked out by the men of science, in whose ranks let us hope to see enlisted some of our fellow students.

THE SINCERE DENTIST; A PUBLIC BENEFACTOR.*

BY LESTER GEORGE, '98.

Every high minded young man, on starting out in life, is desirous of having laid a foundation on which he can rear an after-life resplendent in its deeds of nobleness and self-sacrifice.

---

* Paper selected in open competition, for the Freshman editorship of The Journal.

To show that the students of dentistry are afforded just such an opportunity shall be the object of this paper.

Many professions and callings in life are attracting the attention of young men, but none offer more flattering inducements than that of dentistry. True, other professions may bring larger financial results; but we should ever hold in mind that money is not all of life. It is unnecessary to rehearse to you the progress that has been made in the dental art during the last half century, for that is an old story to you all; but if I can impress upon your minds the fact that with the ever-increasing knowledge of dentistry there are also growing up new opportunities for public and private benefaction; then, indeed has good been accomplished.

In this, our country, we find three professions which are directly related and concerned in the welfare of every household. The first profession is represented by the family physician, the man who is with us from the time of our reception into this world until in death we take our departure. May unnumbered blessings rest upon the head of the family doctor.

The second profession is represented by the minister of the gospel, the one who kindly leads us to forget the worry and care of this life, and think for a time of that life where questions that trouble do not arise. How we appreciate the gentle administration of that just one!

And then last but not least, the third profession, sustained by the family dentist, the one who preserves that which adds so much to the beauty in our lives, and which takes from old age its most unwelcome feature; the one who stands ready to administer timely and kindly relief when troubles assail. Every year finds him more in demand; his services more appreciated.

I have in mind a dentist who has plied his chosen profession for over twenty-five years in the same community. He has patients who first came to him when children, who have since grown to manhood and womanhood and now send their own children to him for dental service. He is a welcome guest on all important occasions in the affairs of the different families which he delights to call his own. He is loved and respected, not only because he is a careful, thorough workman, but because he conducts himself as if he had a personal property in the good will of the patients whom he has watched over for years.

What a noble record! What young man would not desire to have such?

At this point in the consideration of the subject, the question arises: If the dental profession is so varied and presents so many phases of usefulness, what qualifications should the dentist have beside the mere knowledge of dentistry? Only two will be mentioned.

First of all, the successful dentist must be a man of exemplary moral character. In the second place, he must be possessed of a superior education. How can a young dentist hope to win the confidence, the respect, or the good will of his patients if he possess a loose moral character? If he allows the report to get abroad that his conduct in and out of his office is ungentlemanly? No—good moral character must be maintained.

Then, in the second place, the education is very important. As has been shown, the sincere dentist lives in the midst of the families represented by his patients; to many of these families an extensive education is unknown; to such the influence of an educated dentist can not be estimated. Then, again, the dentist, if he would properly retain the position in the social and business world which the profession has secured for him, must be an educated man. The truth of this statement is even now realized; the time is not far distant when the requisite for admission to dental colleges will be much in advance of the present. Possibly a college education will be the requirement. Whatever it may be, the higher the better. Too much education can not be obtained for the carrying out of this professional life.

In conclusion, fellow students, permit me to remind you that to you is given the exceptional privilege of acquiring a profession which will gain for you an entrance into the best families in the communities where you shall reside, there to exert an influence for their good, and your own profit. Improve every opportunity! Fill every idle moment!

To remove the brown color often seen on black rubber plates immerse the piece in bisulphide of carbon for a short time and rinse in water to remove odor.

BRAZILIAN LETTER.

Through the kindness of Dr. Watling the JOURNAL is enabled to publish the following interesting extracts from a personal letter received by him from Dr. J. A. Cook, '94. The letter is dated Campinas, Brazil, November 2, 1895.

" * * * And yet to be a stranger in a strange land where only Portuguese is spoken is not a very pleasant prospect. Within an hour after landing I was fortunate enough to find a man who spoke English and secured him for a guide. By means of the influence of six or seven dollars in tips the slowest custom house in the world was passed in about one hour. I saw people clamoring for their baggage who had been there for two or three days. Sometimes it takes weeks. * * * I saw in Rio the best furnished and most inviting dental parlors I have ever seen. I had a thirteen hours' railroad ride from Rio to Los Paulo and a three and one-half hours' ride from the latter city to Campinas. The scenery along the line was mostly uncultivated hills and small mountains. The railroad was contracted for by the mile and is built to cover as many miles as possible. Yet it was interesting to wind around the mountain tops with light, fleecy clouds rising from the hills below. During the whole trip I did not see a good wagon road outside of the towns nor a well cultivated field.

"Coffee is the chief product about Campinas. The coffee farms are very valuable, and the men who have them live like lords. Living expenses are enormous, as you can see, for all food stuffs are imported. We have potatoes from Spain, butter from Denmark, etc. Campinas is a place of from 35,000 to 40,000 inhabitants, and the negroes are far in the majority. The business streets are stone-paved, and we have the benefit of gas street lamps, mule-propelled street cars and a very good water supply. Five years ago the city was depopulated by yellow fever and there was a scare last spring. People left the town panic-stricken, some not even changing their clothes or locking their houses. The streets are kept remarkably clean, but the poor people have filthy homes. Drinking and other vices are carried to a fearful excess, and are one cause of such frightful fatalities during the fever season.

"Dentistry has the appearance of being a big thing in Brazil, but is not what it seems to be. All our supplies come from the States, and besides the time we have to wait for them there is a duty of forty per cent."

EDITORIAL.

According to Secretary Wade's enrollment, there are at the University of Michigan at the present time 2,850 students. This is an increase of 160 over the enrollment which stood last year unprecedented. The usual increase in the coming weeks is expected to bring the figures up to more than 3,050. This showing is particularly gratifying because the time has come when the multiplication of educational institutions throughout the west is expected to have some effect on the growth of our own university. Neither Yale nor Harvard is holding its own this year as well as Ann Arbor; indeed, Yale has suffered an actual falling off and Harvard, second in athletics, is doing some crowing over the college whose best boast now is that it excels Harvard in the strength of its foot ball team. The explanation of the popularity of the University of Michigan in the face of the competition that exists all about it, must lie in its deserved reputation. What business men call "good will" is something that our university must have a good deal of. Its graduates are dispersed through every state in the Union. Naturally, all other things being equal, the fathers will incline to send their sons to their own *alma mater*. Especially will they desire to do so if the institution continues to stand first-class among the institutions of the country. This our University has done. It has received in years past the most liberal support from an enlightened people and it has met this support with the kind of growth for which the support was given. The steady advance of the enrollment from year to year is gratifying, though it need not be surprising.

The new dental law of New York, which went into effect August 1, is so radically unjust and at variance with the common law of our land that the Journal doubts if it would stand if appealed to the courts. To place the power of revoking a license for sustained charges of unprofessional or immoral conduct, or of gross ignorance or inefficiency in his profession in the hands of the Board of Regents of the State is giving that body autocratic powers which even the courts do not possess. If a person is a menace, through his profession, to the public health or morality, obviously the only legal manner of depriving him of his means of livlihood is by trial before a jury. Examination of candidates for license to practice within the state is provided for by the new law by the creation of a Board of Dental Examiners, which is given the power, in connection with the Board of Regents, of placing the educational standard at its own sweet will. There is no specification of the subjects upon which the candidate will have to pass his examination, and no provision for appeal in case the applicant has reason to believe he has been unfairly treated. While legislation is a necessity in the advancement of the profession and essential to the protection of both the dentist and the public, let us place that legislation on the broad basis of justice to all, which is so characteristic of our American institutions.

WITH the election of the present officers of the Dental Society a new policy has been inaugurated. In the past, instructors from the Dental and Medical schools and persons interested in some new invention of interest to the profession have been invited to speak before the Society. While these lectures, demonstrations, etc., have been instructive and interesting to the students of the department, they have defeated the very object for which the Society was organized several years ago. During the coming year no one not an active member of the society will be asked to contribute to any of the programs which will be presented. The papers read and discussed will be those written by members of the Society. This step has been taken that students, when they leave their *alma mater*, may be conversant not only with the rules governing bodies of men, but may also be able to speak intelligently and without embarrassment in the various national, state and county societies with which they may become affiliated. If this line of activity is closely adhered to we predict that the members of the Society will leave the college not only better equipped to practice their profession, but more thoroughly competent to meet intelligent and educated people.

That dentistry is a progressive science and art is well attested by the large number of dental journals and periodicals which receive the support and encouragement of the intelligent dentist. There can be no standing still in these closing years of the Nineteenth century; a dentist, if he keeps not well abreast of the onward movement of his profession, is compelled to become a mere camp-follower. While the various dental societies are one of the chief factors in this advancement, much has been accomplished by the dental publications. Not only are civilized nations aware of the importance of having a dental literature, but even the semi-barbarous countries are awaking to the necessity of having a medium for the transmission of ideas, dental journals having recently been established in Japan and Russia. We are confident that in less than one generation every recognized government will have its own dental publications. With the wonderful advance made in dental literature in the past few years, it is gratifying to us, as Americans, to remember that the first dental journal published was issued on American soil.

The Freshman editor of the Journal for the ensuing year has been chosen, as was last year ordered by the Dental Society, by his ability in journalism, the choice being made by the Board of Editors from papers submitted. Many excellent papers were received and all were given an impartial hearing by the Board, the one written by Lester George being selected and his name submitted to the Society for confirmation. It is exceedingly gratifying to note the interest evinced by members of the Freshman class not only in the Journal but in the Dental Society. With but few exceptions the members of the '98 class have signed the constitution of the Society and enrolled their names on our subscription books. With the interest manifested by both the Junior and Freshman classes, we predict in the near future an enlarged field of usefulness for both the Dental Society and its organ, The Dental Journal.

Probably the most absolute necessity of the Dental Department is that of better ventilation and light in the operating room. While the ceilings are comparatively high there is no outlet for the impure and heated air except by means of a few small dormer windows, and with the presence of perhaps one hundred and fifty persons in this room for several hours the ventilation should be the best obtainable by modern and scientific means. Several large sky-lights would not only improve the present poor light with which the students have to contend on dark days, but would also provide an exit for the foul air occasioned by the presence of so many people. While the Regents are obliged, because of the hostility of the last legislature toward the University, to be economical in their expenditures, it would seem only just that part, at least, of the earnings of the operating room should be applied towards the comfort and good health of those students who increase the general fund of the University several thousand dollars annually.

THE energy with which the attorney of the State Pharmaceutical Association is following up those druggists who are violating the law relative to the registration of clerks is commendable, and is a valuable pointer to our own state association. In only a few instances during the past year have dentists been called upon to show cause why they should not be fined for practicing without a license. This is not as it should be. While the law is not, in every particular all we could desire, still, why not make the best of existing circumstances; take the Pharmaceutical Association for an example and employ an attorney to push cases against those dentists who are illegally practicing within the confines of the state?

ENOUGH cannot be said condemning the tendency of some students to indulge in rushing in the main hall of our building immediately after nine o'clock. It is embarrassing enough for patients who arrive in the morning for prosthetic work without the addition of dismay engendered by the noise and confusion following any needless disturbance.

WITH this year the JOURNAL makes its appearance in a new dress. This, together with the contents, we hope will meet the approval of our readers. In consideration of the fact that the subscription rate has been reduced to one-half the original price, while the quality of the reading matter has in no way deteriorated, but rather improved, should cause not only our old readers to renew their subscription, but should place on our books large numbers of our alumni.

MISCELLANY.

This department of The Journal will be devoted to methods of operation, formulæ, treatments, or anything that may occur of interest in the every day practice of the profession. Contributions are earnestly solicited.

* * *

An offensive breath may be made pleasant and agreeable by the free use of listerine diluted with water and used as a gargle several times a day.

* * *

A ten per cent. solution of boro-glycerine in water will sterilize forceps, broaches and all cutting instruments, and leave them without any unpleasant odor.

* * *

The law in Germany is very rigid in regard to the testing of vulcanizers. Every vulcanizer must be tested at stated periods the same as a steam boiler, and any one violating the statute is promptly fined.

* * *

An effectual sterilizing agent for use in the office may be made of lysol ʒiv, and water ℥xii. Make this solution alkaline with soda or some other alkali. All small instruments may be sterilized in this solution without fear of any corrosive action. Leave instruments in solution five minutes.

* * *

In Japan a Dental Society has been established known as "The Dental Investigation Association." This oriental society which has a membership of over five hundred has a classification of its members which is unique, recognizing, as it does, the purely mechanical dentist. Its members are divided into four sections, viz.: Those who have passed the national examination; foreign dentists practicing in the country; those who have permits to practice, and students in mechanical dentistry.

The state board of health has sent a circular to all railroad companies instructing them to look out for relatives who disguise contagious diseases by means of technical names and thus secure transportation for corpses, which under ordinary circumstances would be denied. This law, if strictly observed, will effectually stop the spreading of infectious diseases in this manner.

* * *

Students who intend to practice in the state of New York must pass a rigid state examination. There are five of these examinations during the year, the different dates occurring September 24–27, 1895; January 28–31, 1896; April 7–10, 1896; May 19–22, 1896; June 16–19, 1896. Places at which examinations are held are New York, Albany, Syracuse, and Buffalo. Each candidate is notified at what point he will be examined. The subjects covered are anatomy, histology, chemistry, metallurgy, operative dentistry, therapeutics and materia medica, physiology, hygiene, oral surgery and prosthetic dentistry.

* * *

Salol may be used to fill roots by applying the dam, drying the cavity thoroughly and using some good sterilizing agent, then place the crystals of salol in the cavity and pass a hot root drier through the powder, which at once melts and follows the instrument into the canal, by capillary attraction passing to the apex of the root. By repeating this a few times the canal may be entirely filled with the liquid salol. Next a warm tin or copper canal point is passed into the canal and carried as far in as possible without protruding through the apex. It is left for a short time to cool when the canal point will be solidly embedded in a crystaline, antiseptic mass which fills the canal completely. The salol may be melted in a test tube and then introduced into the canal if it is impracticable to place the powder in the canal. Care must be used not to overheat beyond the melting point. A small glass syringe slightly warmed will serve to inject into the canal.

Every morning from nine to eleven o'clock finds a large number of students in the dental library looking up authorities on their work. The library is also open every evening through the week. During the month of October there were about one hundred and seventy books and manuscripts drawn.

BOOKS RECEIVED.

Contribution a L'Etude, de L'Usure Dentaire.—By Harry B. Respinger, D.E.D.G., D.D.S. This valuable contribution to dental literature will be of more than passing interest to the students and graduates of the University of Michigan when it is remembered that Dr. Respinger is a graduate of this institution, in the class of '95.

The only criticism that can be made of this work is, that for the average American dentist, it should be translated into the English language. It is very exhaustive, well illustrated, and shows great care in research and compilation.

Its ten chapters are divided as follows: I, Terminologie; II, Caractères histologiques de l'usure dentaire; III, Observations originales; IV, Résumé statistique de nos observations; V, Déscussion générale sur les causes de l'usure normale et des usures anormales; VI, Modifications, lésions et affections consécutives à l'usure dentaire; VII, Quelques idées nouvelles sur l'usure dentaire; VIII, De l'usure dentaire au point de vue de la détermination de l'age; IX, De l'usure dentaire au point de vue médico-légale; X, Conclusions.

World's History and Review of Dentistry.—By Herman Lennmalm, D. D. S. Coming to our table too late for notice in our last issue it seems almost superfluous to criticize at this late date. The title, it seems to us, is rather misleading, for there is very little of the history of dentistry to be found in its pages. As a compilation, however, of facts and data and of the laws governing the practice of dentistry in the various states of this country and of all foreign countries, it is a host in itself. The amount of useful information it contains can only be estimated by its careful perusal.

It comes from the press of the W. B. Conkey Company, Chicago, and should be found in the book case of every dental practitioner.

ALUMNI NOTES.

W. A. Lampman, D.D.S., '95, was married to Miss Stella Heath, of Hastings, Michigan, September 10. Dr. Lampman has purchased the practice of Dr. S. M. Fowler, '88, of Hastings.

Dr. J. H. Billmeyer, Jr., '95, was seen about the college November 26.

A son was born to Dr. W. J. Mummery and wife, of Milford, Michigan, in November.

D. N. Swift, D. D. S., '94, of Buchanan, Michigan, visited about the college on November 21.

Paul Woolsey, D. D. S., '90, expects to graduate from the Detroit College of Medicine this year.

Dr. G. W. Collins, '94, of Vermillion, South Dakota, spent November 20 in this city, visiting friends.

B. H. Lee, D.D.S., '92, of Grand Rapids, was married August 27 to Miss Frances B. Slayton, of Hart, Michigan. Congratulations.

On the evening of November 27, Dr. M. T. Watson, '93, of Bay City, was married to Miss Genevieve Ryan, at the residence of the bride's parents, Ypsilanti, Michigan.

J. Austin Bucknall, D.D.S., '95, who is now practicing in Detroit, called at the college and on friends about October 20. Dr. Bucknall describes an interesting case in practice in this number of the Journal.

Dr. Thomas H. Low, of Boston, Massachusetts, visited friends in this city December 2a nd 3. Dr. Low was en-route to Denver, Colorado, where he has purchased the practice of Dr. R. de G. Treen, Tabor Opera House block.

At the first regular meeting of the Detroit Dental Society the following officers were elected: Drs. A. W. Diack, '92, president; C. H. Oakman, vice-president; A. W. Haidle, '92, secretary, and Will Cleland, '84, treasurer.

It is rumored that Fred Sizelan, D.D.S., '90, has sold his practice at Muskegon, Michigan, to Dr. S. M. Fowler, and that Dr. Sizelan will soon leave for London, England, to establish himself there. The Journal wishes him every success.

Dr. Carrie M. Stewart, '92, who has been practicing in Texas the past two years, has recently located in our neighboring city, Ypsilanti. Miss Stewart was a member of the first Board of Editors of the Journal, and its best wishes for success are hers.

A very painful accident occurred to Dr. G. M. Moore, '94, of Fond du Lac, Wisconsin, on November 16. The railing of a stairway in the rear of his office gave way, causing him to fall a distance of eighteen feet. He sustained a severe fracture of both ankles.

Dr. Homer E. Parshall, '88, of *Unter den Linden*, 58, Berlin, spent a few weeks in October at his old home, Pontiac, Michigan. Dr. Parshall was accompanied by his wife, who is a resident of Berlin. While in this country he spent a few days in Ann Arbor, calling on friends and visiting the college.

Professors R. B. Tuller and A. H. Peck, of the Chicago College of Dental Surgery; J. G. Reid, of the American College of Dental Surgery, and G. L. Field, of the Detroit College of Dental Surgery, visited the college and friends on November 15. They report an attendance of over 400 students at each of the colleges in Chicago and of about 75 at the Detroit College.

The following alumni were seen about the college and in the city on November 15 and 16: A. W. Diack, '92; W. C. Herbert, '89; H. Kreit, '93; A. H. Kessler, '94; H. C. Raymond, '88 and J. Lathrop, Jr., '94, of Detroit; W. C. McKinney, '94, of Saginaw; C. J. Hand, '84, of Romeo, and J. W. Jungman, '89, of Cleveland. Dr. C. H. Oakman, of Detroit, was also among the number.

DEPARTMENT NOTES.

W. Gray, '97, is at the Northwestern this year.

J. W. Lyons spent his Thanksgiving in Toledo.

C. H. Bailey, '96, passed the summer in Duluth.

J. M. Duffy, '98, is one of the foot ball reserves.

C. P. Bessmer, '96, is finishing his course at Detroit.

Miss Woodin, '98, is a daughter of R. M. Woodin, '96.

E. Janes, '97, has gone to Philadelphia to finish his course.

Miss Edith Phillips, '98, is a sister of C. A. Phillips, '96.

J. H. O'Toole, '96, passed his vacation in the office of Dr. Hall.

We were sorry to see A. J. Wildanger with one arm in a sling. Result of ball playing just before the opening of college.

There are sixty-four students registered in the Freshman class, E. J. Anderson.

Dr. Douglas Anderson, '95, has a brother in the Freshman class.

E. E. Sutphin, '97, is in Davenport, Iowa, in the office of Dr. Kelly.

C. E. Pease, '98, will do the solo work for the Glee Club this year.

J. W. Lyons, '96, has a brother, C. J. Lyons, in the Freshman class.

Miss Jessie Castle, '96, spent Thanksgiving at her home in Battle Creek.

T. M. Sheridan, '96, was at his home, Flushing, Michigan, during the summer.

The class in metallurgy commenced work under Dr. Dorrance Monday, October 28.

During the past year new locks have been put on the desks in the Freshman laboratory.

F. G. Powers spent a very pleasant summer vacation in Battle Creek with Dr. Phillips.

F. G. Powers has the finest chair in the operating room. It is a Columbia and is a beauty.

J. W. Miner, last year's Freshman editor of the JOURNAL, has given up the study of dentistry.

H. J. Livingston, '96, spent his Thanksgiving vacation with C. L. Kemery, '96, of Flint, Michigan.

There are six ladies in the department, one Senior, two Juniors and three in the Freshman class.

Germany sends one representative from across the ocean to the department in the person of Mr. Bröcking.

S. J. and S. A. Farnum were called home for a short time in October by the sickness of a younger brother.

C. L. Sherwood, '96, says he never expects to spend so pleasant a vacation as the one of the past summer.

Dr. E. F. Day is taking a p. g. course with the Senior class. Dr. Day is a graduate of the London Dental Hospital, England.

C. F. Fitch, '96, occupied his time during the past vacation in the office of Dr. West, of Jamestown, New York.

The Juniors and Freshmen can now work in the mechanical laboratory on Saturday forenoons from 9 until 12 o'clock.

G. H. Dennis, '97, was visiting friends in the city a few days about November 15. Mr. Dennis is in the Northwestern this year.

Dr. Haidle has full charge of the Freshman class in mechanical technique this year. Three Demonstrations each week are given the class.

F. J. Hale, from the Northwestern Dental College, and Mr. Smith, from the American, are among the new arrivals in the Senior class.

From a newspaper we clip the following: "Dr. Jennie M. Taylor has gone to Africa. The first woman dental missionary among women."

The same old cry from the Seniors for more light in the operating room. Those much-talked-of electric lights do not seem to have materialized.

Dr. Darling has shown the Seniors some very interesting cases at the hospital this year. The doctor is making his course in surgery very instructive.

The Dental Society and DENTAL JOURNAL have concluded to join hands and purchase a Land furnace for porcelain work to place in the college for the use of the students.

C. F. Steinbaur, '98, was a successful candidate for the 'Varsity Mandolin and Banjo Clubs. By the way there is some very good musical talent scattered through the department.

C. F. Fitch, '96, is on the Glee Club. The department is well represented this year, having two members on the Glee Club and C. F. Steinbaur, '98, on the Mandolin and Banjo Clubs.

The membership committee of the Dental Society has been canvassing the whole department for new members. The result is that there are thirty-two new names which were voted on at the last meeting. Every student of the department should become a member, as the papers and lectures delivered before the Society are of inestimable value to each student.

E. V. Deans, '96, passed his summer vacation at Newport, Rhode Island, where he held down a position in an office and also played ball. Mr. Deans is captain of the 'Varsity ball team for '96.

We are glad to see the smiling face of Herman Prinz again in the class of '96. Mr. Prinz has been in Germany since last spring, where he has been teaching some American ideas about dentistry.

The old soldering table in the mechanical laboratory is a thing of the past. During the summer vacation a new one was erected around the furnace. It is much more convenient than formerly.

The Junior dental class, together with the Freshman medical class, were shown some very interesting specimens of microörganisms in the hygienic laboratory Saturday morning, October 26.

While recuperating this summer G. F. Burke, '96, made a bicycle tour through Canada to Buffalo and from there back to Toledo along the North shore of Lake Erie and he says it was an ideal trip.

We are very sorry to chronicle the death of Frank L. Lee, '96. His death occurred July 20 at his home in Benton Harbor, Michigan. His classmates extend their sympathy to the bereaved family.

Owing to the large amount of work which the Juniors have this semester their demonstration hours have been changed from two to one hour each week and occurs now on Friday instead of Tuesdays and Thursdays.

At the first meeting of the Dental Society for the present year, which occurred October 14, the following officers were elected: President, C. F. Fitch, '96; vice-president, George H. Wooton, '96; secretary, Miss J. A. Burr, '97; treasurer, S. K. Scharlott, '97. The following committees were then appointed: Executive, J. P. Collett, '96; F. G. Powers, '96, and J. M. Rosenthal, '97. Membership, W. H. Buttolph, '96; Ralph L. Williams, '96; H. S. Buell, '96; D. W. Stoup, '97, and C. A. Phillips, '96. The retiring treasurer, S. S. Mummery, '96, and C. H. Bailey, '96, business manager of The Journal last year, submitted their reports, which were accepted.

The Seniors held their class meeting October 14, and the following officers were elected: J. W. Lyons, president; Miss Jessie Castle, vice-president; C. L. Sherwood, secretary, and James N. Clark, treasurer.

W. J. Stapish was called home November 9 by the death of his father, Mr. Joseph Stapish. His death resulted from a stroke of apoplexy. Mr. Stapish has the sympathy of his classmates in his bereavement.

Dr. Dorrance's clinic room has been furnished with a new chair, and a bay window has been added to the north side of the room, furnishing more light. It is now a very neat and convenient room for the accommodation of patients.

Just at present there seems to be a large number of hypnotists in the department. As yet we have not heard of any one having teeth filled or extracted without pain while under the influence of an operator who could hypnotize anybody.

The Freshman class meeting for election of officers was held in the amphitheater November 14. A. W. Chamberlain was chosen president; Miss Bessie Hutchinson, vice-president; D. W. Flint, secretary; R. J. Roper, treasurer, and J. F. Conley, marshall.

There is a rumor afloat that the operating room will be furnished with new chairs next year. Hope it is a rumor that has some truth in it. A college as well known as the University of Michigan ought to have some first-class chairs in its operating rooms.

Quite a discussion took place before the Dental Society at its last meeting, November 17, as to whether the diploma from this college should be written in Latin and the degree changed to D. M. D., or whether it should retain its present form and continue the D. D. S. degree.

Rudy's Pile Suppository

is guaranteed to cure Piles and Constipation, or money refunded. 50 cents per box. Send two stamps for circular and Free Sample to MARTIN RUDY, Registered Pharmacist, Lancaster, Pa. NO POSTALS ANSWERED. For sale by all first-class druggists everywhere, and in Ann Arbor, Mich., by Goodyear & Co.

THE DENTAL JOURNAL.

Published Under the Auspices of the Dental Society of the University of Michigan.

VOL. V. MARCH, 1896. NO. 2.

EXOSTOSIS.*

BY A. W. DIACK, D. D. S., '92.

In writing a paper upon exostosis it seems that the only result obtainable is the freshening of previous but possibly forgotten knowledge, and while this is of itself apology enough for this paper, I would like to add a few remarks about the subject so that it may be presented in a new light.

When I first began to write concerning it I was merely to report a case which was exceedingly interesting to me, but owing to other circumstances I was asked to enlarge my report and present a paper covering the subject of Exostosis.

This pathological condition has been observed for a great number of years and, as the different observers were either men of classical, scientific or pedantic education, it has obtained many names as the years have gone by so that at the present time we have the words *Exostosis*, *Hyperostosis*, *Excementosis*, *Dental Osteoma* and *Hypercementosis*, all applied to this one condition. But this multiplicity of names is hardly to be wondered at when we consider the deficient and ineffective classification and nomenclature of dental science of the past and present. Perhaps we should rather be justified in wondering why we have not more names to add to the above list. So far as I am personally concerned, for scientific reasons I would prefer the term "Dental Osteoma" as being the proper descriptive term. As you all are more or less acquainted with this condition I will not enter into any detailed description of it. But in order to bring the facts plainly before us it might be well to hastily describe it.

---

* Read before the Detroit Dental Society, January 11, 1896.

Exostosis, as we will call it, may be said to be merely an enlargement of the cementum of the root of a tooth. This enlargement may involve either the whole of the original cementum, in which case it is known as *diffused* exostosis or it may be found only on certain portions of the root, pushing itself out in different shapes such as nodular or pyramidal. This latter disease is known as the *circumscribed* exostosis.

This enlargement of the cementum is histologically and pathologically a pure hyperplasia, that is, it is due to an increase in the number of bone elements or cells in the cement, and, to all appearances, this new bone tissue is exactly the same as the normal cementum which is developed from the peridental membrane. The normal cementum is, however, produced at the time of tooth calcification, whereas the new growth, according to well known authorities, is never found in patients less than eighteen years of age. So that we are obliged to ascribe the secondary growth to the renewed activity of the peridental membrane due to causes which are practically unknown, although several theories have been advanced to account for it.

Histologically this secondary growth does not differ from the ordinary bone tissue except that Haversian systems are very rarely found, probably because of the manner and slow process of formation.

Now to look at some of the theories which are said to account for it. Among the many causes enumerated, we have mentioned caries, alveolar abscess, pulp irritation, irritation arising from large proximal fillings, deposition of salivary calculus, traumatic injury and mal-occlusion.

Of all these I think that hardly one deserves as much notice as is given it as the cause of exostosis, but would rather advance a new theory that seems to me to be more rational and based upon scientific facts, and, what is more, is the fac-simile of the theory regarding abnormal growths in other parts of the body. I believe that this condition is due to a derangement of the trophic nerves, if such there be, of the pericementum, such derangement being due to some constitutional cause which may also be hereditary.

As to the causation of the disease by caries the great number of teeth affected with exostosis and yet perfect so far as caries is concerned would, I think, eliminate caries as one of the causes, as it would also pulp irritation and large fillings. Alveolar abscess is hardly to be considered as a cause because of the rarity with which it is found in this condition. As to irritation arising from large proximal fillings, whose edges have not been smoothly finished and the deposition of salivary calculus while we often find them coincident with exostosis, I am of the opinion that the presence of these irritants would rather tend to cause the death of the peridental membrane than to stimulate to an increased and long since ended activity. The necrosis of this membrane from these irritants is an every-day occurrence.

It is also generally held that mal-occlusion is the one cause which gives rise to this condition of exostosis and with great reason too; that is, from a cursory glance at the facts. But before accepting this as a cause it would be well to take into consideration the facts concerning the growth of both the cementum and the alveolar process surrounding the tooth, the situation and size of the exostosis, and when we have done that I think that the grounds upon which mal-occlusion is said to be a cause of exostosis will be found to be untenable.

It is said that mal-occlusion produces an irritation of the peri-cementum, causing it to renew the growth of the cementum. Why should it not also be stimulated to increase the growth of the process by the same cause and thus instead of having an increase in size of the root and an absorption of the process we would, if this theory were true, have an increase in size of both the process and root, as the irritation is equal and to all definite knowledge the same?

Then, too, the circumscribed form. How can we account for the fact that very often the growth will be upon the surfaces, the sides, on which we naturally would think the irritation would be least? So much for that theory. Now, from a view of all the phenomena which accompany this abnormal growth, namely, the secondary activity of the peridental membrane, the age at which this growth occurs, the teeth which it attacks, irrespective of decay or external disease, the presence of the circumscribed variety and, above all, the observance of the influences of heredity upon its appearance, we must come to the conclusion that it is due to a cause far remote from any local disturbance, although such disturbance may become a factor in the growth of the exostosis. In point o˘ fact this pathological condition simulates nothing so much as it does the appearance of bony tumors or osteoma in other parts of the human organism such as the exostosis which appear in the auditory meatus and also the nodular bony growth upon the skull and similar growths upon the bony skeleton which are met with in general surgery. It is time that they are more or less associated with traces of syphilitic affections or the gouty diathesis, but is it not also a fact that we find this condition more frequently in those patients who are of the so-called gouty diathesis?

And then is it not a fact that corresponding bones or parts of the body on each side will be affected by this process? Eminent surgeons thus describe the exostosis of long bones, and in the case which follows I think that the facts seem to point to a similar affection of the corresponding second bicuspids: Miss A, presented June 20th at office, complaining of pain in right side of face. Face and cheek on that side were puffy and inflamed in appearance. Condition was increased by noise or any sudden shock. Pain was also very great at the back of head.

History of case showed nothing definite. Had been treated by physicians for two years but with no satisfactory results. They ascribed the condition to some disorder of liver or digestion. Teeth had been examined but no cavities had been found, nor, indeed, any cause for the trouble, but as the patient had some years previously suffered from a severe neuralgia on left side and had been relieved by the extraction of two bicuspids, she, in desperation, determined to have some extraction done on right side, more as an experiment than anything else. It was in that frame of mind that she presented herself to me, and from her condition of suffering I was perfectly willing to sacrifice any or all of her teeth if there was any chance of giving relief.

But upon examination I failed to find any condition which might give rise to this state of affairs, keeping well in mind the diseases of the antrum and the relations of the teeth to inflammations of that cavity.

She complained of sensitive dentine in the neighborhood of the bicuspids but instruments failed in finding any cavity. However, at the first sitting I painted the gums from central incisor to third molar with a mixture of equal parts of chloroform, aconite and iodine, and told her to paint gums with iodine and report next day, which she did, and much to my susprise reported great relief.

She was obliged to leave town for the summer and so I saw nothing of her until the first week in October, when she again called and reported that for a long while the iodine applications were efficient but had lately been powerless, so that she was suffering worse than ever, and she wished me to take out all the upper teeth on the affected side. I objected, but promised to do so if she would wait a few days so that I might determine if any special tooth was the cause of the trouble.

Remembering the sensitive dentine I wedged the bicuspids apart by means of cotton, not wishing to use the separator on account of the pain and irritation. In two days I was able to examine the space between them and found in the second bicuspid a small area of dentine not more than one sixteenth of an inch square, which was extremely sensitive, but only when the instrument was passed over it in a certain direction. The patient was thoroughly determined upon extraction, and upon my advice I extracted the second bicuspid after very much difficulty because of the exostosis. I then extracted the first bicuspid on account of pain in it at the time, so that I am enabled to show you the two roots and the difference in the size.

Since extraction she has reported twice and I am happy to say there is a decided improvement. Swelling and pain have subsided greatly and patient feels very hopeful. Have not seen the case for two weeks.

While I have no decided opinion on the relations of these facts I am inclined to think that this exostosed bicuspid was the cause of her trouble, the pain being the direct result of irritation and the swelling of the cheek due to reflex irritation of vaso-motor nerves of the parts.

DISCUSSION.

Dr. W. H. Dorrance: I believe mal-occlusion to be a predisposing cause of exostosis, and believe also that it is due to mal-nutrition. Mal-nutrition is a condition brought about by impaired function of the small intestine. My physician in New York who treated me last summer for my ailment, believes that many of the organic diseases are a result of mal-nutrition. When the proper support of the arch has been lost, an irritation follows, which may cause exostosis. An improper or excessive use of a tooth may cause it, such as the cracking of nuts, etc.

Dr. Jas. Cleland: Within the past six or eight months I have had a lady of perhaps forty years of age under my care, who was unable to digest even the most simple food. The teeth were very sensitive and were decaying very rapidly. I finally began extracting one after the other and found all of them very much exostosed, particularly the lower incisors. There was also a condition of excessive redness in the face. Extraction naturally brought relief.

Dr. F. W. Cryderman: I should like to ask Dr. Dorrance what he means by mal-nutrition?

Dr. W. H. Dorrance: It is a condition where any special part, or, perhaps all parts, fail to receive a proper supply of nutrition. The supply may be either excessive or insufficient.

Dr. A. W. Haidle: If this condition of exostosis can be ascribed to a faulty action of trophic nerves, as the essayist claims, then, it seems to me, physiologists have a proof of the presence of trophic nerves, a matter which, at the present time, seems to be one of question. The theory, it seems to me, is exceedingly good. While the term *dental osteoma* appears to be a good one, I think it might be laid aside until such time as our present heterogeneous dental nomenclature can be revised.

Dr. J. M. Thompson: In looking over some notes and in reading up on this subject, I find that persons of weak constitutions are most apt to present this condition. Mal-occlusion appears to be its chief cause, and it is found most frequently in the anterior teeth.

Dr. H. C. Raymond: What concerns us chiefly is how to diagnose exostosis and not what causes it. An abscess cannot be the cause, as some claim, and it is very difficult of diagnosis until after extraction. I have found an electric mouth lamp very serviceable, and particularly in the anterior teeth, where an exostosed tooth may sometimes be diagnosed with its aid.

Dr. A. W. Diack: Dr. Dorrance claims that exostosis is caused by mal-occlusion. I affirm that it is a growth similar to cancerous growths, which we believe are due to mal-nutrition, or, to put it in other words, to a faulty function of the trophic nerves. That it is analogous to cancerous growths is proved by the presence of the circumscribed form.

FOOD-STUFFS: THEIR RELATION TO DENTAL CARIES.*

BY ALLISON WILLIAM HAIDLE, D. D. S., '92.

PHYSIOLOGICAL chemists divide food-stuffs into five great classes: Proteids, carbohydrates, fats, salts and water.

Proteids are again divided into seven classes, those in Class I, spoken of as native albumins, comprise the egg and serum albumins; Class II, the derived albumins, acid and alkali albumins, syntonin and casein; Class III, the globulins, crystallin, vitellin, paraglobulin, fibrinogen, myosin and globin; Class IV, the fibrins; Class V, the coagulated proteids; Class VI, the albumoses and peptones, and Class VII, lardaceïn, or amyloid substances.

The *carbohydrates* are starches and sugars in their various forms and the *fats*, olein, stearin and palmatin.

Proteids are distinguished in their chemical composition, from carbohydrates, in that they contain besides the C, O and H molecule, N and sometimes S.

What, now, is the relation these various food-stuffs bear to dental caries?

Miller, in his "Microörganisms of the Human Mouth," describes dental caries as "a chemico-parasitical process, consisting of two stages, decalcification, or softening of the tissue, and dissolution of the softened residue."

The chemico-parasitical process is simply a splitting up of sugars into lactic acid by a lactic acid ferment, which is in turn produced by the bacterium acidi lactici. The lactic acid thus formed decalcifies the tooth substance and the remaining softened, albuminous material is liquified by other germs of the mouth.

From over two hundred experiments with human saliva, made by Miller regarding the formation of acids from various foods, the following results in acid units were obtained, the "acid unit" signifying that quantity of acid necessary to neutralize 0.1 cubic centimeter of a 0.5 per cent. solution of caustic potash:

---

* Read before the Detroit Dental Society, February 8, 1896.

MATERIAL.	DURATION OF EXPERIMENT.	ACID FORMED IN ACID UNITS.
Bread (dry)	12 and 30 hours	22 and 72
Starch	12 " 30 "	20 " 42
Cane-sugar	12 " 30 "	17 " 37
Grape-sugar	12 " 30 "	19 " 40
Potato (boiled)	12 " 30 "	24 " 75
Corn (in milk)	12 " 30 "	24 " 77
Bread (1.0 g.)	12 " 30 "	35 " 110
Sugar (2.0 g.)	12 " 30 "	20 " 41
Rice	12 " 30 "	25 " 72
Macaroni	12 " 30 "	20 " 76
Meat	12 " 30 "	0 "* —3
Meat (raw)	12 " 30 "	— " —5
Fish	12 " 30 "	0 " —5
Eggs	12 " 30 "	0 " —
Cheese	12 " 30 "	0 " (?)
Spinach (in water)	12 " 30 "	0 " 0
Potato (raw)	12 " 30 "	0 " 0
Salad (raw)	12 " 30 "	0 " 0
Fat	12 " 30 "	0 " (?)

* The sign — denotes an alkaline reaction.

In all but two of these experiments 4.0 cubic centimeters of saliva was used to 0.5 g. of the food tested.

It will be seen from this table that the carbohydrates are the acid-forming foods, and that, therefore, the proteids have little or nothing to do with dental caries. It will also be noticed that raw vegetable foods are less fermentable than cooked, and sugars less than starchy foods.

When starches remain for a short time in a mixture with saliva, the following reactions take place:

$$\text{Starch}+\text{Ptyalin}=\left\{\begin{array}{l}\text{Erythro-dextrin}=\left\{\begin{array}{l}\text{Maltose,}\\ \text{some Dextrose (glucose).}\end{array}\right.\\ \text{Achroo-dextrin}=\left\{\begin{array}{l}\text{the same products, but}\\ \text{with difficulty changed.}\end{array}\right.\end{array}\right.$$

These sugars, maltose and dextrose (glucose)—classed among the grape-sugars—are split up by the lactic acid ferment into lactic acid, according to the equation: $C_6H_{12}O_6 = 2\,C_3H_6O_3$. Cane sugar (saccharose) on the other hand "becomes fermentable only after hydratization," as follows: $C_{12}H_{22}O_{11} + H_2O = 2\,C_6H_{12}O_6 = 4\,C_3H_6O_3$.

The question is often asked, What effect has candy on decay of the teeth? Much care is given at the present time in the manufacture of candies, the chief sugars used being glucose, a grape sugar, and saccharose or cane sugar. Both of these sugars may be absorbed by the mucous membrane of the mouth, and no doubt are, when in contact with that membrane. Should they, however, find a resting place in the deep fissures of the teeth they will be directly converted into lactic acid, and decalcification of the enamel results.

While the eating of candies may therefore endanger the integrity of the tooth, the lodgement and consequent fermentation of starchy foods is far more injurious.

The following analysis of foods by Vaughan, giving the percentage of proteid, carbohydrate and fat in each, may be of interest:

FOOD.	PROTEIDS.	CARBOHY-DRATES.	FATS.	WATER.
Beef, fat	17. %		26.5%	55.5%
Beef, medium	21.		5.5	72.5
Beef, lean	21.		1.5	76.5
Veal, fat	19.		7.5	72.5
Veal, lean	20.		1,	78.
Mutton, fat	15.		36.	48.
Mutton, medium	17.		6.	76.
Pork, fat	14.5		37.5	47.
Pork, lean	20.		7.	72.
Rabbit	21.5		10.	67.5
Goose	16.		45.5	38.
Poultry	20.		4.	75.
Game	22.5		1.	75.5
Tongue	14.5		17.	67.5
Heart	18.		8.	73.
Blood	18.		0.2	81.
Kidneys	18.5		4.	74.5
Liver	20.		4.	74.5
Salmon	16.		6.5	76.5
Salmon, smoked	24.2		12.3	51.5
Stock fish	80.		1.	17.5
Eel	13.		28.5	37.5
Caviar	31 5		16.	43.5
Blood sausages	12.	25. %	11.5	49.5
Liver "	16.	6.5	26.5	48.5
Pork "	16.	29.5	39.5	6.
Rice	8.	76.5	1.	13.
Wheat, fine	10.	75.8	1.	13.
Wheat, coarse	12.	71.5	1.5	13.
Oatmeal	14.5	65.	6.	10.
Buckwheat	9.5	72.5	2.	13.
Wheat bread, fine	7.	55.2	0 5	36.
Wheat bread, coarse	6.	51.9	0.5	40.
Potatoes	2.	20.7		75.5
Cabbage	2.5	6.5	0.5	88.
Garden beans	5.5	7.	0.5	84.
Green peas	6.4	12.1	0.5	78.
Fresh fruit	0.5	10.		85.
Dried fruit	2.5	55.	1.	30.
Eggs	12.5		12.	74.5
Cow's milk, fresh	3.4	4.8	3.6	87.5
Cow's milk, skimmed	3.1	4.8	0.7	90.7
Butter	0.6	0.6	83.3	14.5
Cheese	25.	2.2	29.	39.5

DISCUSSION.

Dr. Jas. Cleland: The elaborate paper we have just listened to gives us a very correct analysis and tests for the alkalies and acids of our food-stuffs. But it is necessary that we should know more than we do on this subject. The civilized world is suffering from a disease that is attacking alike the rich and poor of all classes, a disease which was, to a limited extent, known to the ancients and which has grown in severity with the increase of population and civilization. Animal life must draw its nourishment from sources containing in sufficient quantity their physical constituents. As animals, we develop and subsist solely upon such substances as are taken into the body by way of the mouth as foods. It is plain that food must contain in definite proportions precisely the chemical elements of which our bodies are composed, or perfect development is impossible. A child deprived of lime phosphates in its food has rickets, loss of teeth, etc., etc. An adult eating an excess of starch in the form of white flour, has rheumatism, gout, and loses his teeth early in spite of most skilled dentistry. The dentist, possessing superior knowledge of the teeth, should instruct his patients as to the best means of preserving them by dietary, principals of prevention, etc. Prominent among all destructive foods is common white flour which, with its one chief nutriment, starch, is made into a variety of foods, which as a fact all come from the same barrel. The whole kernel of wheat contains all of the fifteen elements of which the human body is composed and in about the same proportions, and for this reason it may be called the natural food of man. My experience dates back many years. While a boy I lived for a year on my uncle's farm in Scotland and the food of the laborers there was chiefly oatmeal, still these people were never troubled with decay of the teeth. At a dinner a famous Englishman once proposed the toast "Here's to Oats, which Englishmen feed their horses and the Scotch their men." A witty Scot replied "Yes, and where do you find such horses and such men."

Dr. H. C. Raymond: Not long since I had occasion to ask a mother what foods she allowed her little daughter to eat. The teeth of the child were very badly decayed. The mother replied that she fed her children a great deal of malted milk. Whether this was the cause of decay or merely a coincidence I am unable to say. Prepared foods are, I think, very unhealthful, not only to the teeth but to the whole digestive system. Teeth should be exercised as well as other organs. Meats, however, cause an acid condition of the blood, and many a case of pyorrhœa and gout has been bettered by a discontinuation of their use.

Dr. A. W. Diack: I think there is much less harm done the teeth from eating candies than from eating starchy foods and from neglect to properly care for them.

Dr. C. H. Oakman: Dr. Raymond speaks of acids being formed in the stomach from meats. I have been troubled in that way myself. I called on a specialist who prescribed potassium bicarbonate and restricted my diet to purely carbohydrate foods. This immediately produced alkalinity of the blood and I have felt much improved in health since that time. I am troubled with no more neuralgia of the heart or with muscular rheumatism. I have frequently been asked for advice regarding care of children's teeth. I recommend brush and powder, eating of rye or other hard bread, and chewing of spruce gum. I prefer the spruce gum as it causes more friction and cleanses the teeth much better.

Dr. F. W. Cryderman: Mastication is good for the teeth. I believe that powerful acids are developed in the stomach and in the mouth as well. I advise the use of lime water. I once read of the use of creosotum (twelfth dilution) as being of use in these conditions. I tried it and found it excellent and always advise the use of it for my patients.

Dr. A. W. Haidle: I have lately learned that the teeth of candy makers are, as a rule, poor. They attribute this, however, to the use of acids in the candy, many of the weaker acids being used in their manufacture.

CLEANING AND BLEACHING OF BONES.*

BY H. H. LAUDERDALE, D. D. S., '95.

To the student in human and comparative odontology there is perhaps nothing which adds more to the value of a perfect and typical set of teeth than to see them in a skull well cleaned and bleached. A skull, dark, greasy, discolored or weather-beaten, offends the vision of one accustomed only to those of perfect whiteness, as does a poorly finished plate or filling that of the skilled operator.

---

* Read before the Dental Society, January 7, 1894.

As no dental education is complete without a study of odontology, perhaps a few hints as to the way to best prepare skulls and bones may prove acceptable, especially to those who wish at some time to possess a collection of skulls.

A skull in the flesh or one which, though dry, has been properly roughed out and dried will always make the best specimen.

Roughing out, as the natural science collector would term it, is removing the skin and the major portion of the flesh from the skull. Care should be taken when working on the under side of the skull not to injure the often long and delicate styloid, hamular and other processes.

With a flattened instrument, slightly bent at one end, remove all the brain substance possible. Place the roughed-out skull in a bucket of cold water, changing the water daily until it is no longer bloody. If it is not convenient to macerate the skull at this time take it from the water and place it in a shady place to dry. It can then be kept as long as desired and will have little or no odor. On the collecting grounds the skulls are treated in this way and can then be shipped to any point in safety.

Roughed out ligamentary skeletons—the skeletons of all smaller animals, reptiles and birds are of this kind—are soaked in an aqueous solution of arsenic for fifteen minutes to protect them from the ravages of insects which would otherwise destroy the ligaments by which the bones are held together when mounted. Skulls, of course, do not need this treatment. Skulls should never be buried in the soil or boiled in water to remove the flesh, as either method tends to set the blood in the bones and leave them dark and discolored. Placing them in an ant-hill and allowing the ants to remove the flesh will produce the same effect. Skulls exposed for a long time to the weather become dark and can rarely be whitened.

Place the bucket containing the roughed-out specimens in a warm place, and, in summer, which is the best time to macerate, place in a sunny location, filling the bucket as the water evaporates. In winter a covered crock in a warm, sheltered nook will do, though the maceration process will be much slower. In Milan, Italy, where large numbers of skeletons are macerated yearly, pieces of horseflesh are thrown in the macerating tubs to hasten the decomposition. The time of maceration varies, being best in summer, slower in winter, fresh skulls in this climate in the summer requiring from six to eight weeks. When the skull has macerated sufficiently remove it from the bucket and scrub it in clean water with a stiff brush until thoroughly cleansed. A scraper is often of great service in cleaning the skull cavity.

Now take two gallons of water, bring it to the boiling point and add first two pounds of washing soda and then one pound of chloride of lime. Then, with a brush, wash the skull in this solution, commonly called Javelle water. The washing soda assists in removing the grease from the skull, while the chloride of lime bleaches the bones by means of the chlorine liberated. The length of time the skull is washed in this solution will depend on the strength of the solution and quality of the bone, strong, hard bones not being easily affected, while a delicate bone, left long in the solution, ceases to exist in its original form.

After washing the skull in Javelle water the proper length of time, rinse thoroughly in clean water to remove any of the lime which may have been deposited, and which, on drying, fills the small pits of the bone, giving it an unnatural, chalky appearance. Place the skull in the sunshine, when it soon becomes white. If, after two or three days, it is not as white as desired, again wash in Javelle water. If the skull shows signs of grease place it in a glass jar containing naphtha and allow it to remain in the sunshine, the jar to be covered with a glass plate to prevent the readily volatilized liquid from vaporizing. The skulls are placed in the sunshine as the warmth assists the action of the naphtha. The time needed to properly degrease skulls depends considerably on their size, the smaller ones being degreased more rapidly than a relatively larger skull. For small skeletons and skulls about two months would be the average length of time required.

After removing from the naphtha again wash the bones in the Javelle solution, rinse in water and again place in the sun to bleach. In many fresh skulls the bones show little or no signs of grease, and do not need this treatment, and in large skulls and skeletons a special machine is needed, which, though doing the work quicker and using a much smaller amount of naphtha, is much more likely to injure the bones.

The bones from the dissecting room if strongly injected seldom bleach perfectly, just why I cannot tell, the arsenic with which the subjects are injected being, no doubt, the cause. Bones of this sort often remain in maceration for a year and a half and then are very hard to clean, while fresh specimens would be fully cleaned in one-fourth of that time.

In macerating skulls great care should be taken to prevent any brass or iron getting into the water, as the brass renders the bones of a greenish hue, which, as yet, nothing has been found that will remove. The iron rusts the bones, and then they must be scrubbed in hot hydrochloric acid, washed in Javelle fluid, rinsed in clean water and bleached.

CODE OF DENTAL ETHICS.*

ARTICLE I.

THE DUTIES OF THE PROFESSION TO THEIR PATIENTS.

SECTION 1. The dentist should be ever ready to respond to the wants of his patrons, and should fully recognize the obligations involved in the discharge of his duties toward them. As they are, in most cases, unable to correctly estimate the character of his operations, his own sense of right must guarantee faithfulness in their performance. His manner should be firm, yet kind and sympathizing, so as to gain the respect and confidence of his patients; and even the simplest case committed to his care should receive that attention which is due to any operation performed on living, sensitive tissue.

SEC. 2. It is not to be expected that the patient will possess a very extended or a very accurate knowledge of professional matters. The dentist should make due allowance for this, patiently explaining many things which may seem quite clear to himself, thus endeavoring to educate the public mind so that it will properly appreciate the beneficent efforts of our profession. He should encourage no false hopes by promising success where, in the nature of the case, there is uncertainty.

SEC. 3. The dentist should be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill which is their right.

---

*Adopted by the American Dental Association, August, 1866.

ARTICLE II.

MAINTAINING PROFESSIONAL CHARACTER.

Sec. 1. A member of the dental profession is bound to maintain its honor, and to labor earnestly to extend its sphere of usefulness. He should avoid anything in language and conduct calculated to discredit or dishonor his profession, and should ever manifest a due respect for his brethren. The young should show special respect to their seniors; the aged special encouragement to their juniors.

Sec. 2. The person and office arrangements of the dentist should indicate that he is a gentleman; and he should sustain a high toned moral character.

Sec. 3. It is unprofessional to resort to public advertisements, such as cards, handbills, posters, or signs calling attention to peculiar styles of work, prices for services, special modes of operating, or to claim superiority over neighboring practitioners; to publish reports of cases, or certificates in the public prints; to go from house to house soliciting or performing operations; to circulate or recommend nostrums, or to perform any other similar acts. But nothing in this section shall be so construed as to imply that it is unprofessional for dentists to announce in the public prints, or by card, simply their names, occupation, and place of business; or in the same manner to announce their removal, absence from, or return to business; or to issue, to their patients, appointment cards having a fee bill for professional services thereon.

Sec. 4. When consulted by the patient of another practitioner, the dentist should guard against inquiries or hints disparaging to the family dentist, or calculated to weaken the patient's confidence in him; and if the interests of the patient will not be endangered thereby, the case should be temporarily treated, and referred back to the family dentist.

Sec. 5. When general rules shall have been adopted by members of the profession practicing in the same localities, in relation to fees, it is unprofessional and dishonorable to depart from these rules, except when variation of circumstances requires it. And it is ever to be regarded as unprofessional to warrant operations or work as an inducement to patronage.

ARTICLE III.

THE RELATIVE DUTIES OF DENTISTS AND PHYSICIANS.

Dental surgery is a specialty in medical science. Physicians and dentists should both bear this in mind. The dentist is professionally limited to diseases of the dental organs and the mouth. With these he should be more familiar than the general practitioner is expected to be; and while he recognizes the superiority of the physician in regard to diseases of the general system, the latter is under equal obligations to respect his higher attainments in his specialty. Where this principle governs, there can be no conflict, or even diversity, of professional interests.

ARTICLE IV.

THE MUTUAL DUTIES OF THE PROFESSION AND THE PUBLIC.

Dentists are frequent witnesses, and at the same time the best judges, of the imposition perpetrated by quacks, and it is their duty to enlighten and warn the public in regard to them. For this and the many other benefits conferred by the competent and honorable dentist, the profession is entitled to the confidence and respect of the public, who should always discriminate in favor of the true man of science and integrity, and against the empiric and imposter. The public has no right to tax the time and talents of the profession in examinations, prescriptions, or in any way, without proper remuneration.

OBTUNDING AGENTS FOR SENSITIVE DENTINE.*

BY C. H. BAILEY, '96.

SINCE the era of modern dentistry much has been said and written concerning the obtunding of sensitive dentine. That the subject is of vital importance is demonstrated by the large number of nostrums and secret preparations on the market for this purpose and the eagerness with which a certain class of dentists purchase and advertise their ability to perform painless dentistry with these too frequently dangerous concoctions. If the excavating of a cavity could be made entirely painless the bank books of hundreds of dentists would undoubtedly show a larger balance on the right side, for the reluctance of the majority of people to having their teeth properly cared for is due to the fear of pain.

---

*Read before the Dental Society, November 1, 1895.

Before going into the discussion of the drugs used as obtunding agents in sensitive dentine perhaps it would be pertinent to review the histology of the tooth. We are all aware that throughout the dentine, running at right angles to the long axis of the tooth, are the dentinal tubuli, connecting with the pulp cavity. It has been demonstrated that the tubuli are lined by a very delicate but tough membrane, and that the periphery of the pulp cavity is lined by a layer of odontoblasts. Whether the dentinal tubuli are filled with minute nerve fibres or with the modified processes of the odontoblasts is still an open question, though the latter is the accepted view. That protoplasm has the power of transmitting impulses can easily be demonstrated. Take, for example, an amœba, a single cell, but one which has the characteristics of life, sensation to heat, pain, etc., for if a lively amœba be exposed to a temperature lower than the one necessary for his best living, his activity is lessened, and vice versa if the temperature be raised, up to a certain degree. Place an amœba in chloride of zinc or carbolic acid and it is coagulated, and, as the contents of the dentinal tubuli are identical in composition with these minute organisms, these drugs would have the same effect if applied to the dentine; they would coagulate the protoplasm in the tubuli. While the susceptibility to pain would be decreased with the destruction of these protoplasmic processes, as there would be nothing to transmit the pain, the pulp would also be endangered. Arsenic would be a perfect agent in obtunding sensitive dentine, were it not that here again we meet with the same objection, that the life of the pulp would, in all probability, be destroyed.

In a paper read before the Columbian Dental Congress, Dr. W. C. Davis, of Lincoln, Nebraska, said:

"In view of the fact that we know the cause of the irritation and the medium by which it is transmitted, and as this medium is not composed of nerve tissue, and as its destruction is not permissible, nor its coagulation, owing to the jeopardy of the pulp, it is my theory that the only means by which the dentine will ever be rendered insensible to the surgeon's instruments is by the removal of the protoplasm from the dentinal tubuli. This would of itself be sufficient, were it not for the fact that the dentine is hygroscopic—capable again of taking up moisture; from within by capillary attraction, from without by contact with the atmosphere.

"It is, therefore, my theory that after the extraction of the protoplasm we should deposit in its place another substance which is not in itself capable of transmitting sensation. The best means of extracting the protoplasm is the application of some agent not in itself injurious to the dentine or pulp, but which has a great affinity for moisture, of which protoplasm is very largely composed. Absolute alcohol is at once suggested. To assist its chemical affinity for moisture it had best be applied warm, as heat assists chemical action and also favors evaporation.

"If hot air is then applied, it will thoroughly vaporize the alcohol, carrying away the moisture it has extracted from the tubuli, leaving them empty. To whatever distance they have been emptied, to that distance we have destroyed the medium for transmitting pain. In other words we have obtunded the sensibility of the dentine. The next step is to fill the tubuli with some other substance. I fill the tubuli with a resinous gum in suspension in a volatile oil. Almost any one of the essential oils will answer the purpose, as they are composed of volatile oils and the resinous oils which we need. Probably nothing works better than oil of cassia, as upon the application of hot air the oils are easily volatilized, and if it has been diluted slightly with alcohol it will readily go into the tubuli as far as they are empty, leaving its gum to fill the space. To this distance you can excavate with impunity; consequently the success of the operation will depend upon the thoroughness with which you extract the protoplasm. In teeth of some structure it seems to be readily extracted to a considerable depth; in others it is next to impossible. I do not think the failure of this method in some cases is due to any mere structure or nerve complication, or nervous idiosyncrasies of the patient, but rather to the anatomical structure of each individual tooth and each individual cavity. For I sometimes find cavities in the same teeth, perhaps one on either side, seemingly the same distance from the pulp. In one it works perfectly; in the other it is extremely difficult to operate, sometimes meeting with no success. At the same sitting I will find a difference in different teeth in the same mouth. You may ask what I consider the difference in the anatomical structure, which would cause such a variance in the result of our attempts to extract the protoplasm, and I would say that our failure would be due to the relation of each tubule to its neighbor and partially to the size of the tubuli. Also where the tubuli are filled to quite a depth with the products of fermentation and micro-organisms, as alcohol does not have a great affinity for these ferments; consequently they would not be taken up so readily, as where the tubuli are filled with unadulterated, healthy protoplasm."

Another agent advocated in the obtunding of sensitive dentine is the inhalation of ether. The patient usually holds the napkin or cone, upon which but a very few drops of ether are placed, and inhales until the first effects of anæsthesia are produced, stopping short of unconsciousness. The odor is an objection, of course, and while it is probably not used by many dentists, one eminent practitioner gives to this remedy the title of "King of Remedies."

Cocaine is a drug in common use by the profession to-day, though probably more as a local anæsthetic for the extraction of teeth than as an agent in allaying pain during an operation. But after once testing its efficacy as an obtunder no dentist is willing to have the magic crystals absent from his medicine case. That the drug has fallen into disrepute with many dental surgeons is undoubtedly true, but aversion to the use of this remedy on the part of many practitioners is probably due to the notoriety the drug has attained by the methods of unscrupulous and irresponsible men in the profession. It stands to day, however, pre-eminently the remedy for obtunding sensitive dentine. Its modus operandi is as follows: After the cavity has been made as dry as possible with the use of hot air, the raised temperature and dehydration of the tubuli not only lessening sensibility, but also providing for the absorption of any medicant placed in the cavity, the cocaine is applied in solution in chloroform. The only obstacle to its application in and around the teeth is the difficulty of securing absorption. If you can once cause it to reach the spot where you wish it to act it will anæsthetize every time it is applied.

A purely mechanical method used by many operators is the use of sharp excavators to quickly remove the generally small area of hyper-sensitive dentine, under this layer the dentine being usually normal in response to sensations from without. The rapid rotating of a small, highly-polished burnisher over the walls of the cavity will many times obtund the sensitiveness so that the operation can be continued with the maximum of comfort to both patient and operator.

In conclusion let me say that in those cases where it is undesirable to proceed with the operation, owing to the delicate health, nervousness of the patient, etc., probably the best method is to seal powdered tannin in the cavity, when, in a few days, it will be found that the tooth can be thoroughly excavated without those sensations of exquisite pain which make the dental office a place to be shunned until the last resource of those in need of the dentist's services is exhausted.

THE LITERARY PHASE OF DENTISTRY.

THE volume of literary matter representing the aggregate annual output in the field of dentistry is sufficient to convince any one that there is no present lack of writers or subjects upon which to write. When, however, the product is critically examined, and that which possesses real value is sifted from what is of doubtful merit, the need for improvement in the general average character of our literature becomes evident.

The improvement needed relates to at least two qualities in our literature: first, the nature of the matter which forms the subject; and second, the method of its presentation as literature—its literary dress, so to speak. More care as to these two features would eliminate from our literature in all of its departments much that is worse than useless, so far as any substantial benefit to dentistry is concerned, and would increase the value of that which really possesses intrinsic merit, by rendering it more attractive and more easily assimilated by the profession.

There is no lack of strong reasons why the literary tendency among practitioners of dentistry should be persistently cultivated. The benefits resulting from such a course affect both the profession as a profession and its members as individuals.

The cultivation of the literary tendency by the dentist, at least so far as it pertains to his profession, is one of the surest roads to success. This, we believe, is a fact which can scarcely be doubted.

By the literary tendency of the dentist in this connection is meant the ability to clearly and accurately describe whatever ideas he may possess that will add to the total of dental knowledge. This also necessarily implies the willingness to do so.

It may be well to define what is here meant by success. While we would not discredit the legitimate effort to achieve success in the acquisition of wealth or things having material value, it was long ago shown and is everywhere and constantly seen that these things of themselves do not bring a full compensation in happiness for the labor expended in their attainment.

Real success—that which endures to the end, and makes life a thing of beauty—is the resultant of certain motives and tendencies that have their foundations deeply laid in the individual character. First and most important of these essentials is the desire and ability to aid our fellows in developing to a higher plane of living, to impart to others something of what we ourselves may possess, that they may be benefited thereby. Life furnishes unlimited possibilities for the practical application of this principle. Its relation to the literary tendency in dentistry is perfectly plain, and when conscientiously applied does bring its full measure of the kind of success to which we have alluded. It does more than this. Neither professions nor corporations are as soulless as the disgruntled ones and malcontents would have us believe. The material success which is due to a man in compensation for labor well performed is as certain to come to him in just measure as a result of the appreciation of his colleagues, as is the success which he achieves within himself through the consciousness of having done well.

As to the effect of an improvement in our literary product, so far as the profession of dentistry is concerned, there can be no doubt. A tree is judged by its fruits. The thought of the profession is crystallized in its literature, and our status, as compared with other departments of life, is measured by the standard of our relative intellectuality. When we improve that, we in the same degree elevate dentistry.

It is frequently said that the ability to write is not given to every man; but it may be asked, is it ever given to any man? Is not literary ability an acquirement and a result of study and training as much, for example, as is the ability to perform certain operations in dentistry?

There are, no doubt, so-called geniuses, and there have been men who seemed to have a special genius for writing, but the real geniuses whose works have done the most to uplift and better humanity are those who according to Carlyle had a genius for hard work. Geniuses of this character can therefore be made, and, so far as literary ability is concerned, a fair degree of success is possible even to the ordinary average man if he is willing to make the effort to attain it. Many of our most careful observers and skilled practitioners are timid about publishing their ideas, largely from lack of familiarity with literary methods. Under the mistaken impression that they lack the gift of literary expression, they not only deprive the profession of much that would benefit it and, indirectly, humanity also, but they fail to receive that general recognition from their colleagues to which their real worth justly entitles them; they achieve but a fraction of the reputation which would otherwise certainly come to them.

The literary tendency in dentistry is, therefore, something which should be cultivated and promoted, not only for the benefit of the profession as a class, but for its value to the individual writer, who is the first to receive its benefits.

An additional reason for the individual cultivation of the literary tendency is its educational value to the writer.

A conscientious writer is in the very nature of the case compelled to be a close observer and student; the conditions of his work train him to habits of accuracy in these particulars. None but the hopelessly ignorant or those without a fair degree of respect for the truth have the temerity to submit to the court of public criticism a literary effort not based on experience correctly reported.

Such a course has uniformly proven suicidal to the reputation of the author when persisted in. There is no means of self-education for the dental practitioner more thorough in its effectiveness than the training which leads to successful literary work within his professional lines. There is good reason to believe that the literary tendency in dentistry is constantly developing; the character and volume of the work being done shows an all-around improvement on that done in previous years.

A noticeable and commendable expression of the growth of this tendency is the appearance of several dental periodicals published under the editorial management of undergraduate students in several dental educational institutions in this and other countries. Some of these possess a degree of excellence equal to some, and superior to many, of the dental periodicals published under the editorship of full-fledged practitioners. In this connection we take pleasure in calling attention to the DENTAL JOURNAL published by the students of Michigan University Dental Department, as a creditable and commendable effort in dental journalism.

The training of the dental student in a literary way cannot fail to be of the utmost value to him in his professional career. It is a feature of such importance that the colleges of dentistry would make no mistake in fostering and promoting enterprises of that character wherever possible. Student dental societies are a generally recognized feature of college life, and for equally good, or even better, reasons the college journal should take its place as one of the important auxiliaries of our dental educational method.

A training in dental literary work which has had its inception along with elementary training in dentistry, and where the two are developed *pari passu*, would, if generally adopted, soon lay the foundation for a thoroughness and accuracy in the future literature of our profession which has been sadly lacking heretofore.—*February Dental Cosmos.*

ESTABLISHING A DENTAL PRACTICE.

The following extracts from a lecture delivered by Dr. Hoff before the Dental Society, February 3, seem to us to be of so much value to the students of our department that we take the liberty of publishing them:

"It is different and more difficult to establish a professional than a mercantile business, for the latter is conducted on set rules, though there are well defined lines necessary to follow in order to build up a professional business, and some of the most elementary rules are the most necessary. The requisite essentials can be classified under the following three heads:

1. Personality.
2. Location or place.
3. Business methods.

"Personality. The first thing to consider under the head of personality is whether a man is adapted to the work or whether he is a misfit. He must have the right qualities for a professional success, that is, he must be physically a well man, and have average mental attainments. Too many people think anyone can be a success in dentistry. If he has not good physical health he will be unable to exert a magnetic influence over his patients, and it is almost impossible to do good work if the operator is nervous and easily irritated. This is not the only necessity for good health, for energy will develop business. Your resources are yourself and should be husbanded as carefully as the banker does his capital.

"Man is so versatile that he can adapt himself to any condition, and if he has the determination to become a dentist this determination to be thorough will generally make him a good dentist.

"A man should be thoroughly prepared before commencing the study of dentistry, as after-success will depend upon the care taken to qualify, not that we must qualify to gain admission to the college, but because we desire to be in the front ranks of the profession.

"We are too apt to think high position is due to chance, but not once in a thousand cases is eminence in the profession due to any element of chance, but is rather due to hard work, and the man who first qualifies and then works is bound to succeed. Preparation is, therefore, of paramount importance.

"A person should be in hearty sympathy with his work, for he who is not in love with his profession will find it impossible to make a genuine success. Even the distasteful work will be done thoroughly by the dentist thoroughly imbued with love for his chosen calling because of that love. With this and the other two essentials a man cannot help but be a success.

"Location. Hard to give advice as to location, as each one must settle that question for himself. The beginner is apt to be timid, and think he should go to some very small place for a year or two in order to gain experience. The chief objection to this is that he will not be compelled to do anything requiring special skill, and for the real ambitious person this is not the thing. Go in the poorer section of some large city for experience rather than in some country village. A dentist could do a great deal of good among people who are unable to pay much for dental services, and at the same time the operator would gain confidence in himself.

"It is sometimes a good thing for a young man to associate with some older practitioner. Though he will not gain much self-reliance by this he will be kept from many mistakes.

"There are only two other ways—open an office and conquer a business, or purchase a practice, and my preference is for the latter. Any dental office, however poorly it has been conducted, has some clientele, and is better than opening an office, for it will give the beginner an opening, which is all he needs. Around one family an entire practice can be developed. A young man can go to any city in which he wishes to reside and work up a practice, but a practice established in a city where the dentist does not care to live will never give satisfaction.

"BUSINESS METHODS. A dental practice must be conducted on business principles, for the better business man a dentist is the better will be his practice. He must be in his office during business hours, even if there are no patients in sight. Do not be visible in your office after business hours, for it gets your patients into bad business methods. When you make appointments do so with the view of filling up the day and not to rush out a lot of work, or else you do yourself an injustice, tiring yourself out and robbing those patients with whom you have engagements. Keep your appointments, and when it is necessary to keep a patient waiting make explicit explanations.

"Keep your books posted up to date, never trusting your memory for even the slightest operation. Have a system and an order in your business methods.

"The many little technical details should be carefully attended to, and always remember that your patient's time is worth as much to him as yours is to you.

"In conclusion let me say that success is only a relative term and he who is the most in love with his profession, who finds his work most congenial and whose greatest pleasure is performing necessary operations is meeting with far greater success than the dentist who imagines success is to be computed only by the number of dollars received for his services."

AMALGAM.*

BY STANFORD JAMES FARNUM '96.

Probably no filling material is attracting more attention to-day in the dental profession than amalgam, and from its misuse and abuse at the hands of those who attempt to use it, it has become an object of contempt to many of those who are recognized as representatives and leaders of the profession. Nevertheless, it has proven itself to possess qualities that compel its recognition as a most valuable filling material. It has, like all other filling materials, its good and bad qualities. It is easily handled, is very adaptable to the walls of the cavity, withstands the process of mastication, and preserves the teeth. On the other hand it discolors the teeth. This discoloration, however, does not always occur, and in many cases the fillings keep their original brightness for years, answering in that respect as well as gold. There is no substance in the market to-day that will preserve the teeth for a longer period of time than will amalgam, and it is my purpose in this brief article to call attention to its method of preparation and uses as a filling material.

We will first consider what is amalgam. One or more metals held in combination with mercury, by the mercury, forms an amalgam. Mercury unites readily with most metals, and for this reason is of the utmost importance. There are only a few metals which will not unite with mercury. The only ones that I can recall are iron and platinum, and mercury even adheres slightly to the platinum. Many amalgams have been formed, as for instance, amalgams of lead, silver, iron, zinc, copper and platinum. The amalgam used for the filling of teeth is an alloy containing two or more metals which is cast in the form of an ingot and shavings made. By mixing these with a sufficient quantity of mercury they form a coherent mass. Coarse shavings are better than fine ones as we do not have as large a surface exposed to oxidation. The metals generally used for the formation of the alloy are tin and silver, and to these we may add gold, platinum, zinc, or copper, though rarely using the latter. A great many experiments have been made in the production of amalgams with a view to gaining density and sufficient hardness to resist fracture at the borders, to withstand the process of mastication, to be impervious to the acid secretions of the mouth, and the changes of temperature.

---

*Read before the Dental Society, February 24, 1896.

From these numerous experiments the conclusion was reached that silver and tin with the addition of a small amount of some other metal, form the best amalgam, although this is far from being perfect. A small percentage of gold added to the tin and silver alloy forms with mercury an amalgam which hardens rapidly and has sufficient density and strength for filling. It is thought the gold controls the shrinkage to a certain extent. Two per cent. of aluminum added to the alloy makes it brighter, but when the mercury is added heat is produced, and the mercury is thought to burn up or consume the aluminum. It seems to have the same effect on the shrinkage as the gold, but more marked.

Nearly every manufacturer of dental supplies has, through a long series of experiments, placed on sale "alloys" which they call "amalgams" and claimed to possess points superior to all others, and each have their admirers and users, while practically they are the same. The best amalgams set the quickest. We also have on the market gold and platinum alloys which are advertised to be superior alloys as they will not shrink or discolor the teeth. From tables and experiments we find nearly every gold and platinum alloy to be composed of more than fifty per cent tin, and more than forty per cent silver, while the remainder, about seven per cent, is composed of gold and platinum. So the alloys advertised as gold and platinum alloys cannot be much superior to those of silver and tin, for the addition of so small a part of gold can be but in a slight degree advantageous, and the addition of platinum, no matter in what proportions, has not as yet proved of any benefit.

The cause for the majority of failures in the use of amalgam lies in the preparation of the cavity, the rules which govern the preparation of cavities for gold being ignored in the preparation for amalgam. The operator does not prepare the cavity with the same care. In the preparation for gold his first thought is to remove all the decay which is possible with safety to the pulp. This is done to procure a firm foundation and to prevent leakage. The cavity should be easy of access, have strong walls, and beveled borders. While preparing a cavity for amalgam, the dentist usually places little or no importance on the matter of the removal of the decay, especially if the tooth is a little sensitive, and rests easy on the thought that the amalgam will stay in any event. This fact alone accounts for the number of amalgam fillings which either leak or come out, for so long as a bit of decay remains in a cavity to be filled, the filling cannot answer the purpose for which it is intended. Even more care should be exercised in the preparation of a cavity for amalgam than for gold. The cavity should be slightly larger inside than at the border, nearly ball shaped, to conform with the spherical tendency of the amalgam, no decay or soft matter should be allowed to remain and the walls should be at right angles with the surface of the filling. These conditions are usually very easily obtained, except in compound cavities, and some of these it seems impossible to shape at all. In such cases one should always use a matrix, just as for gold. The less metal inserted in a tooth the better are the results obtained, so in all cases of deep cavities, whether for gold or amalgam, I would recommend that the cavity be first lined with phosphate.

It has been said that the ideal filling material is a plastic, but all the plastics which have been used so far except amalgam have proved themselves of no value. Amalgam is, therefore, with all defects the most permanent and useful of the plastics for filling. There is no condition or position of the teeth and cavities which preclude its use, as it sets almost unaffected by the presence of moisture; its limitations are, however, ignored. I would not advocate its use for the filling of teeth where it will show in conversation, but as a filling material for the posterior teeth there is none better. It is, therefore, often inserted in the bicuspids, molars, and the posterior cavities of the cuspids, and is especially adapted to molars on account of size of the cavities, and the forces to which they are exposed.

One great fault with the dentist is the lack of proper instruments for the insertion of amalgam. For a gold filling we have a large assortment, while many are the operators who attempt to put in an amalgam filling with nothing except a hand burnisher. The instruments need not be many, but only six or seven round ended instruments of different sizes and shapes. There are several methods of mixing the amalgam. The most common, probably because it is easiest and handiest, is by mixing in the hand with the thumb or finger. The best way, however, is by mixing in a mortar, but even then the operator generally completes it in his hand. The method of shaking in a glass tube is very good.

Another important question now confronts us. How much mercury shall we use? This varies with the number and kind of metals in the alloy, more being needed in alloys containing gold and platinum, than in alloys containing silver and tin, and in these cases more mixing is needed to get the proper union. The amalgam should be rolled up in the form of a ball, and, after drying the cavity, it should be placed and then packed either by hand pressure or by malleting. The hand pressure is most convenient and is considered the best method. Another careless habit of the operator is in finishing, for many are the fillings that are sent out without any finish except by the hand burnisher. As a rule the filling cannot be finished at the first sitting, and the best results can be obtained from two to three days after the operation, when it can be finished the same as a gold filling, by using the gold bur and finishing strips.

In conclusion. What is in store for amalgam fillings in the future, by the dental profession, I cannot predict, but if used with care and discretion it will prove itself an excellent material for saving the teeth.

A UNIQUE specimen of dental art was shown to the JOURNAL early last month by Dr. Darling. It consists of a skull upon the right side of the upper jaw of which is an extensive piece of bridge-work to replace the lost bicuspids and first molar. The anchorages are the second molar, cuspid and right lateral. The two centrals are capped with amalgam upon their lingual aspect and several of the teeth of the lower jaw are crowned with gold. The skull is one obtained from a subject used in the doctor's course in surgery to the medical students.

EDITORIAL.

At a meeting held in December by the class of '96, the matter of petitioning the Board of Regents, through the Faculty, to change our degree from D. D. S. to D. M. D. and to print our diplomas in Latin, was brought up. A committee was appointed to interview the members of the Junior and Freshmen classes to see if concerted action could be taken in the matter, but as yet the committee has not reported. The arguments of those in favor of a diploma written in Latin and bearing the title of D. M. D., are that, inasmuch as Latin is one of the requirements for admission into the department and that the Medical schools confer their degrees in Latin to students of whom no more Latin is required than of Dental students, we also should receive diplomas written in the universal scientific language. The chief argument in favor of the D. M. D. degree seems to be in the fact that that degree is conferred by but a very few schools and those of the best, while the D. D. S. degree can be obtained by anyone willing to devote eighteen months in three years to this object. While those in favor of a change in the degree have some good arguments, still we think that all should work for unity in the title of the degree conferred upon the practitioner of dentistry, thereby making the degree not only a universal one, but one that will carry with it the conviction that its possessor is entitled to the highest consideration as an alleviator of human ills and pains, and most dentists undoubtedly are in favor of the degree of D. D. S. To the regular medical practitioner but one degree is granted throughout the entire country, and not until the Association of Dental Faculties decides this question of unity in the title of the degree conferred, whether it be that of D. D. S. or D. M. D., can we firmly establish ourselves in the public mind as a liberal and progressive profession.

In view of the fact that in a few short months the members of the present Senior class will have reached the goal of their ambition and have conferred upon them the degree of D. D. S., the Journal thinks the time propitious for the publication of the Code of Ethics, that each member of the class may have a broader idea of the duty he owes to the profession, his *alma* *mater*, the laity, and to himself. The conception of too many in regard to our professional code is that in restraining from advertising they are living up to the very letter of its articles. This is far from the truth, and though this evil was considered worthy of special mention by the framers of our professional ethics, it is only one of many temptations which urge the recent graduate to depart from his professional morals as he sits in his office waiting for the patients that materialize all too slowly. Success is only a relative term, and while the charlatan may seemingly be prosperous, no one is so well aware as himself that only for a limited period can he hope to retain the confidence and respect of the people unfortunate enough to entrust to him the preservation of their dental organs. The whole substance of our Code of Ethics may be summed up in the Golden Rule, and, this motto ever in mind, together with courage, patience and perseverance, will place our graduates in a position to be an honor to their profession and their *alma mater*, retain the respect of their fellowmen, and, at the same time, cause them to be true to themselves.

WHY is it that the library of our department is not more generally used by the students? While at any time from one to fifteen can be found there engaged in the perusal of dental literature, this is but a small percentage of the body of students. Is this seeming lack of interest due to indifference to the theories and truths which make the foundation of dental science, or is it due to the fact that the student has so many and varied theories lectured into him that he unconsciously rebells from adding any more at the risk of forgetting some of the facts he has learned earlier in his college course. Should not the fact that the library is ignored by many students point to the necessity of more practical work in prosthetic dentistry? Would not more work *in the mouth* urge the student to greater exertions in studying the principles and theories of every case he might have in hand? While, of course, the clinic in prosthesis is limited, could the college not do the plate, crown and bridge work for dentists too busy too take care of this branch of dentistry for themselves? This would not only be a favor to the practicing dentist, but could be made the source of more or less revenue to the college and of valuable experience to the students.

At a meeting of the Dental Society held in December it was voted to make the Society and the Journal joint purchasers of a "Land" furnace, the furnace to be presented to the college for the use of the entire body of students. While some opposition was encountered, it being contended that the college and not the students should make the purchase, still a large majority were in favor of buying this furnace as a step in the direction of more instruction in porcelain work. While our course in crown and bridge-work is all that could be desired, being equalled, probably, by but few colleges in the country, in the matter of porcelain work we are lamentably weak. This, perhaps, is not the fault of our instructors, but due, rather, to the shortness of the course, for the three years spent by the conscientious dental student in the University of Michigan are busy years, and probably not until the course is extended to embrace four sessions of nine months each will it be possible to give adequate instruction in this desirable and fascinating branch of dentistry.

Owing to the frequency of examinations during the past month it has been impossible for the officers of the Dental Society to obtain promises of papers written by students for the meetings of the Society, and Drs. Dorrance and Hoff kindly filled the breach. Dr. Dorrance gave an interesting talk on "Gold and Porcelain Inlays," while Dr. Hoff gave us some valuable hints on the "Essentials in Beginning the Practice of Dentistry."

REPORT OF THE OPERATIVE CLINIC FOR 1894-5.

Crowns, Logan	57	Fillings, plastic	1,335
Crowns, gold	57	Treatments	1,350
Crowns, porcelain	3	Extractions	609
Bridges	8	Cleanings	493
Bands	2	Number patients	7,540
Fillings, gold	5,305	Number operations	9,219

In Dr. Dorrance's clinic up to date 439 cases have been presented and operations completed for seventy-nine persons, including three operations upon the superior maxillary and one upon the inferior. Two cleft palate cases have also been cared for.

ALUMNI NOTES.

Dr. F. C. Clapp, '95, was married January 1, 1896.

Dr. Harry P. Ball, '92, is located at Albion, Michigan.

We learn that Dr. B. T. Ruthruff, '95, is practicing at Lorraine, Ohio.

Dr. A. Barnes, '95, has left Petoskey and is now practicing at Grand Ledge, Michigan.

A recent letter from Dr. George W. Kenson, '94, of Mansfield, Ohio, states that his practice is all that can be desired.

The story comes from Decatur, Illinois, that Dr. T. S. Childs, '92, was lately presented with a two and one-half pound boy.

Dr. F. P. Graves, '95, is located at Lansing, where he has began practice for himself, having left his father's office at Battle Creek.

Dr. J. H. Neeley, '95, was married to Miss Lula A. Sites, of Lancaster, Ohio, on January 1, 1896, at the home of the bride. Congratulations of the Journal.

Married.—On January 1, at Oshkosh, Wisconsin, Dr. Harry B. Hinman, '95, of Bucyrus, Ohio, to Miss Katherine A. Ihrig. Congratulations of the Journal.

Dr. O. M. Barton, '95, a member of the Journal staff of last year. is now located at Boise City, Idaho. The best wishes of the members of the present staff are yours, Barton.

Dr. G. A. Rawlings, '93, of Bismarck, North Dakota, visited the college and numerous old friends on February 26 and 27. "Vet" reports his practice as being in a very flourishing condition.

We learn that Dr. F. W. Boyer, '93, who gave up the practice of dentistry to enter the salt manufacturing industry, is possessed of a four months old boy, and that he himself has grown to the enormous weight of 215 pounds.

Dr. Jas. K. Douglas, '94, of Sandusky, was married to Miss Maora Belle Hill, of Berlin Heights, Ohio, on December 31, 1895. A wedding trip to Detroit and a visit with Dr. and Mrs. J. Lathrop, Jr., followed. The Journal wishes the happy pair all there is of good in life.

C. A. Hawley, D. D. S., '93, editor-in-chief of the JOURNAL for that year, has been made professor of Orthodontia, Dental Anatomy and Crown and Bridge-work of the Dental Department of the Ohio Medical University of Columbus, Ohio. Dr. Hawley is one of the most progressive of our graduates and the Ohio Medical University is to be congratulated. The JOURNAL'S good will is extended.

Misfortune seems to follow Dr. B. S. Palmer, '83, of Chicago. On July 4th last, while attending a game of base ball, a giant cracker exploded near him and the loss of an eye resulted. On January 1st, the doctor was operated on for appendicitis and a recent letter to Dr. Watling says that he is becoming afflicted with a cataract on his remaining eye. Troubles never come singly and the JOURNAL extends kindest sympathy.

DEPARTMENT NOTES.

The Dental department reached its majority with the close of 1895.

F. J. Hale, '96, improves his Saturdays in the office of Dr. Watling, at Ypsilanti.

The dental library was open to the public from 9 to 12, during the Christmas vacation with the exception of Christmas, New Years and Saturdays.

The first sections in histology, qualitative chemistry and practical anatomy finished these courses at the time of the Christmas vacation. The second sections in the latter two studies now occupy the laboratories.

C. E. Pease, '98, C. F. Fitch, '96, and C. F. Steinbaur, '98, were at Lansing and Grand Rapids with the Glee and Mandolin clubs the first of the holiday vacation. Later in the intermission they were at Toledo and other points.

The committee on commencement invitations, consisting of H. J. Livingston, J. N. Clark, C. L. Sherwood, I. W. Copeland and B. T. Hunt, have placed their order with the engraving firm of E. N. Wright, of Philadelphia. The chairman of the committee, H. J. Livingston, has a sample of the invitation which can be seen by anyone interested.

G. F. Conley, '98, has recovered from a recent attack of the grip.

Miss Jessie Castle, '96, has recently been confined to the house for a few days with the grip.

An inspection of the mechanical work executed by the members of the Freshman class convinces one that there is a great deal of artistic ability in the class of '98.

The students who remained in Ann Arbor during the holidays were allowed the use of the laboratories from 9 to 12 o'clock on all days except Christmas, New Years and Saturdays.

The alumni of the department will be sorry to learn that the dome of the main building has been removed. Its removal was necessary for the safety of University Hall and makes a decided change for the worse in the appearance of the building.

Considerable interest is being manifested over the '96 class picture to be placed in the operating room, it being undecided as yet whether it be cabinets of the individual members set in matting or a group picture of the class and faculty, both having their advocates.

The following officers were elected for the second semester for the Dental Society: President, A. P. Dutch; Vice-president, S. A. Scharlotte; Secretary, Miss Bessie Hutchinson; Treasurer, Carl Putt. Papers were read by S. J. Farnum, '96, and C. A. Quackenbush, '96.

The prospects are favorable for having a department base ball team. A meeting was held by the Freshman class with that object in view, at which a Manager and Captain were elected. Nearly twenty applications have since been received for positions, and as there are quite a number of good players among the classes a creditable team can be expected.

Some ill-advised person or persons on the evening of February 13 took the liberty of using the door of the front entrance of the Dental building as a bulletin board to notify the public of an X. Y. Z. ball. While the erratic and irregular form of our old building is hardly appealing to an artistic eye, nor its color such as would cause a stranger to be struck with admiration, still the students of the department have strong objections to its use as a bill board.

Dr. Neeley will quiz the Seniors in Dental Surgery and the Freshmen in Histology this semester.

C. L. Kemery, '96, was confined to his room for a couple of weeks during February with an attack of parotitis.

The question, "Where are you going to locate after graduation" is frequently asked in the corridors of our building among the Seniors.

Would it not be a good idea to have more chairs in the library? As it is at present, only about a dozen students can find seats at one time.

Germany has another representative in the Freshman class in the person of Charles Lebert, who entered at the beginning of the second semester.

During the recent absence of Dr. Haidle, Dr. Hoff lectured to the Freshmen on the subject of mechanical technic. This was the first lecture delivered to the '98 class by Dr. Hoff.

The Freshmen have selected a class pin, which is of a very neat design. It is diamond shaped, contains the college colors, a small forcep to represent the department, and the figures '98.

The appeal for more light in the operating room, which has been made by the Seniors year after year has been heard, and now the room is illuminated by means of the improved Welsbach gas burners.

An instructive lecture was given the Freshman class last month by Dr. Dorrance on the subject of cleft palate. The lecture was made especially interesting by the presence of a cleft palate patient.

Some excitement was caused a short time ago among the Seniors by the rumor that the diplomas to be received were to be changed to a much smaller size, of poorer material and worse type. Only an idle rumor, however.

The following students represented the Dental fraternities on the various Annual Promenade committees. Delta Sigma Delta—W. H. Johnson, '97, chairman of committee on arrangement; H. D. Watson, '97, committee of invitation; C. A. Devlin, '96, committee of decorations. Xi Psi Phi—S. W. Hussy, '97, general secretary; S. K. Scharlotte, '97 committee of arrangements, and C. F. Fitch, '96, reception committee.

There have been several interesting cleft palate cases in Dr. Dorrance's clinic during the present school year, and several more are expected before the spring vacation. Dr. Dorrance has given some very instructive lectures on these cases and how to handle similar ones in practice.

We now have two modern chairs in the operating room, which are, however, private property. W. J. Stapish is the owner of one, a Wilkerson, and the other, a Columbia, is the property of F. G. Powers. Other chair manufacturers would find it to their advantge to have one or more of their chairs where they could be inspected by the students.

The following ladies were entertained by the Dental fraternities at the First Annual Promenade: Xi Psi Phi—Mrs. Lowrie, Ann Arbor, and Mrs. Charles Babbitt, Jackson, Chaperones; Misses Potts, Babbit, and Hunt, of Jackson; Miss Powell, of Marquette; Misses Smith, Kearns, Burke, Seery, Durham, Kemper, Dilworth, of Ann Arbor; Miss Loder, of Lapeer. Delta Sigma Delta—Mrs. N. S. Hoff, Mrs. Stoup and Mrs. Deuble, Chaperones; Misses Remington, Deuble, Ellis, Ypsilanti; Miss Town, Cadillac; Miss Staebler, Ann Arbor; Miss Hill, Detroit; Miss Saxton, Jackson; Miss Johnson, Alliance.

At a meeting of the Dental Society, Monday, February 19, Dr. Dorrance gave a very interesting and instructive talk on "Gold and Porcelain Inlays." He said he was aware that many members of the profession were opposed to their use, but it was his opinion, after an experience of many years, that if used in their proper place and properly inserted porcelain and gold inlays possessed many commendable features. On the labial surfaces of incisors porcelain finds its best field, while on large, though not deep cavities of molars and bicuspids gold or porcelain could be used. The formation of cavity and the thorough burnishing of the shell of platinum or gold to it were of primary importance to a successful filling. He had several models with him, showing the work in its different stages. The talk was listened to with great interest by those present and Dr. Dorrance was given a vote of thanks by the Society for his efforts in their behalf.

I. W. Copeland was out of town a few days between semesters.

F. G. Powers spent a few days in Battle Creek at the close of the first semester's work.

The Dental Department was well represented at the Leap Year party given by the ladies on the afternoon of February 29. Over $500 was realized by the ladies towards their gymnasium fund.

A chapter of the Delta Sigma Delta fraternity was established at the Detroit Dental College Saturday, January 22. Alpha chapter of Ann Arbor was represented by B. T. Hunt, '96; C. A. Devlin, '96; S. J. Farnum, '96; C. H. Bailey, '96; F. R. Fletcher, '97; and E. J. Anderson, '98.

Victor C. Bell, D. D. S., Special Lecturer upon Crown and Bridge Work, New York Dental School writes: "I consider Borine an excellent general antiseptic mouth wash and cordially recommend it to my patients, especially to those wearing artificial dentures."

Dentists will find in Borine prophylactic and hygienic properties that make it invaluable as a mouth and tooth wash, in fact Borine might be termed "The Ideal Dental Antiseptic."

Borine in its natural state will devitalize the mouth in a quarter of a minute, while it does not harm the delicate epithelium or injure the dentine, a fact which cannot be claimed for any other antiseptic.

THE DENTAL JOURNAL.

Published Under the Auspices of the Dental Society of the University of Michigan.

VOL. V. MAY, 1896. NO. 3.

HÆMOPHILIA.*

BY J. H. NEELEY, D. D. S., '95.

Being very recently called to treat a severe case of bleeding, and being also requested to mention to the profession a very peculiar case that came under my observation during the month of August last I have chosen the subject of Hæmophilia for a short talk this evening, hoping to present to you a few thoughts that at some (usually unexpected) period may prove of value.

In August last, a boy twelve years of age and a supposed hæmophilia was brought to me by his father and his attending physician to have several temporary teeth extracted, experimentally to determine the advisability of a more serious operation they were then hoping to make. Upon examining the mouth I noticed a very peculiar arrangement of the teeth, the permanent ones standing very irregular, but the temporary ones all present, being carefully retained for fear of lacerating the gums sufficient to cause bleeding, a brother having died from a similar cause.

Not desiring to risk too much, an upper and lower temporary incisor were removed, with no apparent sign of dangerous bleeding. The parent was encouraged and was planning for the more severe operation, when matters took a sudden turn. Some twelve hours after the extraction and upon the patient lying down extensive capillary bleeding began, and, for a time, refused to be checked. The striking feature of the case was the fact that bleeding never occurred in both jaws at the same time, always ceasing in one before appearing in the other.

---

* Read before the Dental Society, March 30, 1896.

Careful inquiry revealed the fact that the male children were all affected with the bleeding tendency, while the females were entirely free. The parents also were healthy and could in no way account for the marked appearance of it among the boys. The disease is perhaps best defined as a congenital and habitual disposition to the occurrence of hemorrhage.

It usually begins in the very earliest years of life, rarely, if ever, originating in middle life, and very rare is it that a marked bleeder in infancy loses entirely the idiosyncrasy in youth and remains thereafter free from attacks.

Reports show it to be almost entirely a modern acquisition and the most hereditary of all diseases. It does not seem in any sense a true pathological process, but rather an abnormal condition depending on some original vice of structure. The only mark is a certain delicacy and transparency of the skin, with a superficial position and a marked fullness of the subcutaneous vessels. The vascular system alone seems out of order. The intima appears thin and in many cases apparently undergoing a sort of fatty degeneration, rendering it unable to withstand the high blood pressure to which it is subjected.

Family transmission direct and indirect is the most important cause of the disease, the indirect transmission being the most marked; that is, after one or more cases have appeared among the children of healthy parents. The disorder is handed down, not by the bleeders themselves, but by the non-bleeding brothers and sisters. A large number of bleeders die so early in life as to be unable to take any part in the propagation of the disease, but bleeder families present another remarkable peculiarity, viz.: Extraordinary fruitfulness of the non-bleeder brothers and sisters, direct investigation showing that the average number of legitimate births in bleeding circles is nearly twice that of the general average.

The anomaly occurs most frequently in the males and generally only the males or the females of the same family are affected, rarely both; but if both are affected the males are in excess. While the males are affected most frequently the females possess in a far greater degree the capacity for transmitting the disease by inheritance to the offspring. Male bleeders rarely beget bleeder children by women of non-bleeder families, but children of women who themselves are bleeders are uniformly affected with hæmophilia.

Again, the males in bleeder families who themselves are not bleeders seldom beget bleeder children from healthy wives, but among the children of women who belong to bleeder families, but who are not bleeders themselves, some are generally found who are marked bleeders. Hence it must be admitted that to the non-bleeder women in bleeder families is due the constant and increasing spread of the disease. Bleeding usually appears in early childhood, especially at the time of first dentition, and gradually declines in intensity with advance of life, but in some cases the symptoms recur again and again up to old age. While the exciting causes are usually wounds, contusions or wrenches, the little scratches, harmless to ordinary persons, are seemingly the dangerous ones, death resulting more often from slight than from extensive wounds. Death usually results from the first attack, a very few reaching maturity. Out of two hundred and twelve cases reported by Grandidier one hundred and twenty-one died under eight and only twenty-four reached the twenty-second year. In treatment the cautery should never be used. Compression for hours and often for days is good, where it may be obtained. If bleeding is from sockets of extracted teeth a tampon of cotton saturated with per-sulphate of iron may be put tightly in the socket and retained by closure of the jaws. For internal treatment acetate of lead, two grains every two hours, is perhaps the most trustworthy. Ergot, thirty minims every two hours, is also good. In extreme cases both drugs may be used with excellent results. Alum and tannin are less reliable. If the patient is an infant the mother or nurse may compress the part with the fingers for hours, if necessary, until the bleeding ceases. If the sockets are shallow an impression may be taken in compound, the cavity packed with styptic cotton and the impression again slipped to place and retained as long as necessary.

Base ball and rugby men would confer a favor upon the members of the Senior class by refraining from breaking the windows in the operating room, especially when clinics are being conducted.

DENTISTRY IN THE UNITED STATES.*

BY C. A. QUACKENBUSH, '96.

DENTISTRY was introduced into this country nine years before the Revolutionary War, John Woofendale, an Englishman, in the year 1766, being the first to practice dentistry on this side of the Atlantic. Later a Frenchman, named Lemaire, came over with the French fleet and served as dental surgeon among the soldiers in winter quarters near Providence, Rhode Island. Here, in a military camp, enlisted as soldiers for the cause of independence, as pupils of Dr. Lemaire, Jarial Flagg and John Garette became the first students of dentistry on American soil. Both became proficient in their profession, and also served as gallant soldiers. Flagg afterward received the commission of a major in the war of 1812.

In 1770 Dr. Isaac Greenwood came from England to Boston and practiced dentistry until his death. His two sons, Clarke and John, chose the profession of their father. John, too, was a soldier. He fought at Bunker Hill and at Trenton and went with Arnold on his expedition into Canada. His reputation as a pioneer dentist rests on the fact that he served in that capacity the first President of the United States. Out of the tusk of the hippopotamus, he carved a full set of ivory teeth for the "Father of his Country." He is also credited with having swedged up the first gold plate in America.

Some of the other forefathers of American dentistry were Hudson, Randall, Hayden, Kœcker and Parkhurst. Most of these men had studied at medical schools and were well fitted for the crude operations that then constituted the practice of dentistry. So even from the earliest days of the history of the professsion we have had men whose presence has been most beneficial, and whose examples are well worthy of imitation. Such men have laid the foundation stones on which is built the present system of dentistry.

The number of dentists in the country in 1800 was one hundred. Ten years later this number had grown to only three hundred. But at the present time we have more than twenty-five thousand. Estimating the population at sixty-five millions, we have one dentist for every twenty-six hundred people. Of course the number is increasing rapidly, but so is the population. Many of the old practitioners are retiring; there is a constantly increasing demand for dental work, and it has been stated that a large proportion of the dental graduates, for various reasons, do not practice long after graduation. So we believe that for the well equipped and enthusiastic dentist there is still room at the top.

---

*Read before the Dental Society, March 16, 1896.

A few figures given by Arthur may give us some idea of the magnitude of the work that is annually accomplished by the dental profession in this country. In 1880 there were three millions of porcelain teeth manufactured and used to replace lost dental organs. In the same year the number of teeth extracted was estimated to have been twenty millions. Undoubtedly many of them were sacrificed to the unwise use of the forceps, and could have been saved. The amount of pure gold manufactured into foil and used to prevent the ravages of caries was three tons. Think of it! Three tons of pure gold used every year to fill cavities of decay, to say nothing of other filling materials!

Arthur goes on to say that the American dentists take the firse rank in the world as operators, and, as we know, Dr. Weeks says that the graduates of the U. of M. are the best gold workers in America. The logical conclusion is evident. Even in Paris, the French dentist who has never seen America puts on his sign "Dentiste Americain."

The upbuilding of the profession of dentistry from a small beginning in 1800 to its present magnificence we attribute to three causes:

1. Dental societies.
2. Dental literature.
3. Scientific discoveries.

These three, by stimulating thought, encouraging investigation and research, and producing a demand for higher qualification of the dental practitioner have been influential in bringing about the establishment of the dental colleges and the dental laws.

Dental societies have been one of the most potent factors operating for the enlargement and general welfare of the profession. They have largely wrought in a mass the individual dentists of the country. They have opened up a valuable channel for the exchange of ideas and for the gaining of knowledge. By this means the dentist is enabled to come into touch with his professional brethren—to compare himself with others and to catch many valuable hints that would otherwise escape him.

But of all the forces that have been at work in the uplifting of the dental profession there is none more powerful than our dental literature. This has grown to such proficiency that it embraces every phase of dental art, which is thus brought easily within the reach of every dentist who is at all progressive. He is enabled to keep up with the times and to ever have at hand a valuable source of knowledge. If he cannot attend the county or state dental society, he can read the dental journals.

We have in mind a dentist who had practiced twenty-eight years, and who did not know that the inferior dental artery existed. He was not a reader of dental literature.

The value of this department of dentistry cannot be overestimated. It is voluminous with the valuable works of its many authors, many of whom are noted for their scholarly attainments and abilities.

Dental literature may be divided into two classes. The first class we would denominate as standard works, and mention as some of its most eminent authors, Abbott, Arthur, Black, Bödecker, Colyer, Garretson, Farrar, Harris, Evans, Gorgas, Taft, Talbot, Tomes, and many others with whom we are all acquainted.

The second class is current literature, as the periodicals, which always print so many new and interesting ideas, methods and suggestions.

The first dental journal was the American Journal of Dental Science. It was first published at Baltimore, 1839, the same year in which the first dental college was founded.

We have at present no less than ninety dental periodicals. Some of the most popular are the *American Journal of Dental Science*, *American Dental Review*, *Dental Cosmos*, *Items of Interest*, *Ohio State Dental Journal*, *Dental Review*, *Archives of Dentistry*, and many others could be named.

Scientific discoveries have had much to do with the progress made in dentistry of late years. The discoveries made in bacteriology, histology and pathology make it possible for the educated dentist to perform his operations in a scientific manner.

The increase of new remedies enables the various diseases to be treated each in its peculiar and proper way. The discovery and use of chloroform, ether, nitrous oxide and cocaine have done much to make dentistry what it is.

The use of India rubber and the perfection of crown and bridge work have greatly increased the demand for artificial dentures. The wearer of artificial teeth is no longer obliged to pay for the expensive gold or silver plate of early days, for the rubber plate can now be made by some so-called dentists for the price of three dollars; while a substantial piece of work is obtainable by all who care to have it.

To Dr. C. A. Harris is due the credit of making the first attempt to establish a dental college in the United States. In 1839 he attempted to found a dental school in connection with the University of Maryland, but was unsuccessful. Later he became instrumental in establishing the Baltimore College of Dental Surgery, the first dental college in this country. He has been justly called the founder of the dental educational system in the United States.

We now have forty-six dental colleges. Illinois claims the largest number, having eight. The dental department at Harvard was founded in 1868; of the University of Minnesota, 1888; and that of the University of Michigan, 1875, so we are now twenty-one years old.

In making the advances that we have in the past ninety-six years, we have simply kept apace with the same American "go-aheadism," as the Frenchman calls it, that has characterized all other phases of American progress. We are no longer regarded as mere mechanics and tradesmen, but stand before the world, members of a respected, useful and dignified profession.

FRACTURE AND TREATMENT OF INFERIOR MAXILLARY.

BY F. E. LOGAN, '96.

In early times if the surgeon who was called upon to treat fracture of the inferior maxillary succeeded by some means to cause the fragments to unite he congratulated himself on having treated the case so successfully. It was of little consequence to him whether the contour of the face was marred or if the teeth were not perfectly articulated.

At present, however, it is very different, When the bone is firmly united the face must have its original contour and the teeth articulate, as before the accident was sustained, or our patient is dissatisfied and we are no better pleased than he. Therefore it is quite essential that every dentist should be well informed in this particular branch of surgery, for he is liable to be called upon at any time to treat a fracture of this kind either in co-operation with a surgeon or alone.

In fracture of one of the limbs the general surgeon has only to contend with the contractility of the muscle upon which the limb depends for action, but this is not the case in the lower jaw, for besides the muscles which govern the movement of this particular member, he has also to contend with the muscles of the tongue, larynx, pharynx and neck, all of which tend to displace the fragments and without the aid of a skilled dentist the result accomplished is rarely, if ever, what it should be.

Fractures of this bone are difficult of treatment; first, because of the inability to splint them in the same manner as other bones; second, on account of the numerous muscular attachments, most of which, besides giving mobility to the jaw, perform various other offices.

There are two classes of fractures, simple and compound. In the former there is a single break in the continuity of the bone without any external or associate injury. In the latter, however, we may have two or more fractures accompanied with laceration of the soft tissues, injuries of the nerves, vessels, teeth, etc.

Blows from the fist, kicks from animals, falls and gun-shots are the most common causes of fractures, or any similar concentrated forces may cause simple or several breaks to occur simultaneously.

The seat of the fracture depends much on the condition of the arch, the direction and character of the force brought to bear upon the bone, but usually the lesion occurs at the point where the force has been applied.

Symptoms denoting fracture of this bone are very seldom, if ever, of an obscure nature, so that you can usually make a definite diagnosis. You will observe that the bone can be moved at the break, causing a grating sound or crepitation, the line of the teeth generally being irregular.

When fracture has taken place under the attachment of the masseter muscle the jaw is not displaced, but crepitation is always present, and when the neck of the bone at the condyle is broken the jaw is drawn forward and to the opposite side by the action of the internal pterygoid muscles.

Pain, swelling, inability to masticate, crepitation and irregularity in the dental arch, these symptoms when taken collectively, afford us abundant proof that fracture of the bone has occurred.

When inflammation and swelling are present they may be controlled by the application of cold water, or better to apply cloths which have been saturated in a pint of water to which has been added lead acetate, ʒii; laudanum, ℥ii.

The manner of treatment of these fractures depends much upon each individual case. As far back as five centuries, B. C. Hippocrates used ligatures of silk, gold and platinum wire to hold the fragments in place, but in the present age we prefer to resort to more substantial means.

Bandages have been used alone to hold fractured parts in their proper position, but in oblique fractures the bandages are rather unmanageable, and it is almost impossible to counteract the tendency of the internal pterygoid muscles from drawing the rami forward.

Many surgeons use the gutta percha splint, which is readily formed. The fracture is first set, the jaws approximated, and the gutta percha is moulded to the parts. Then this mould is held firmly in place by bandaging.

When the fracture has occurred near the anterior part of the mouth, an anesthetic has been given, and good results have been obtained by drilling holes near the end of each fragment from the outer surface; a silver wire is passed through the holes from the lingual side and the free ends are twisted tightly on the labial surface, this causing the ends of the bone to be drawn into close apposition and preventing its movement. This wire does not favor the accumulation of foreign substances, is easily kept cleansed, and does not cause any unnecessary annoyance to the patient.

In compound fractures the interdental splints are invaluable and reliable, and the one which is easiest in construction, taking up the least amount of room in the mouth, and having the requisite strength and other qualities which go toward making a splint serviceable is the one we desire to have. We must first take an accurate impression of the superior maxillary and pour up a model. Now take an impression of the lower maxillary, which may be taken in section or entire. After procuring models from these impressions, saw them into sections and articulate them to your model of the superior teeth. This being done unite the blocks in one piece by a little soft plaster. If you have been careful in your work the reconstructed model represents the jaw as it was previous to the accident. Now make a plate of vulcanite to cover the crowns of all the lower teeth and of the upper teeth also, as far as the cuspids, leaving the remaining space to feed the patient through. Then fit the plate to the upper teeth first, the lowers may then be fitted into the lower surface of the plate and when this is accomplished you have all the teeth in their normal position. Take a bandage 1½ yards long and 2½ inches in width, stand behind the patient, rest the chin on the centre of this strip, and carry the ends up, cross on the forehead, carry around the sides of the cranium, cross again at the occiput, carry forward and tie or otherwise fix in front of the chin. The patient should then be given an antiseptic mouth wash and a syringe with instructions to thoroughly cleanse the mouth once a day at least. Leave the splint on for about twenty-eight days.

Fractures may sometimes fail to unite. This may be caused from comminution, want of rest, or faulty apposition of the parts. Should necrosis exist, await the exfoliation of the sequestrum and treat for necrosis. If the ends of the fragments become rounded and tipped with cartilage an operation is necessary. This may be accomplished by boring holes in the end of each fragment and wiring them together. Irritating the ends by rubbing the fragments together, thus causing the desired inflammatory action, is still another means sometimes employed.

This has been a banner year for athletics, that is as far as the Dental Department is concerned. Never before has there been so much interest, or has it contained so many candidates for athletic honors.

CHLORATE OF POTASH AS AN ANTISEPTIC.*

BY P. G. UNNA, M. D.

IN 1884 Prof. Miller first published in the "*Deutsche Medicinische Wochenschrift*" the results of his experiments as to the action of various antiseptic agents on bacteria cultures taken from the cavities of the mouth.

These tests interested me very much, mainly because my attention had previously been called to the constant activity of the schizomycetes in the formation of mercurial stomatitis. Having noticed that Miller's tables, which had formerly been generally referred to, made no mention of either chlorate or permanganate of potash, I suggested to the author the advisability of subjecting to an examination this class of oxidizing substances, particularly chlorate of potash, permanganate of potash and peroxide of hydrogen in his future experiments. The idea that the bacteria of the mouth, accustomed to the continuous deoxidation taking place might possibly be rendered less harmful by the employment of oxidizing agents, guided me.

Prof. Miller was kind enough to entertain my proposition, and in the following year published a number of new tables, all of which contained the three ingredients spoken of. It was noticed, however, that peroxide of hydrogen alone directly interfered with the growth of the fungi of the mouth; its destroying properties being second to that of corrosive sublimate and nitrate of silver. Permanganate of potash acted much weaker and surprisingly weak was the action of chlorate of potash, mentioned at the end of the list of antiseptics. The latter is detrimental to the growth of schizomycetes only when used in a solution exceeding the proportion of one to eight.

The apparently unfavorable showing of Professor Miller's experiments is evidently responsible for the little importance at present attached to chlorate of potash in the manufacture of preparations for the preservation of the gums and teeth, and I am confident that modern antisepsis in treatment of the mouth is fully in accordance with the principles set forth in the valuable and well-known hand-book of Miller.

On page 226 Miller says:

---

*Translated from *Monatshefte für Praktische Dermatologie.*

"It is noteworthy that such useful agents as chlorate of potash and permanganate of potash possess such subordinate antiseptic properties; like iodoform the favorable action of these remedies does not particularly depend upon their antiseptic value."

Nothwithstanding the conclusion drawn from Miller's tables, I was still so fully convinced of the specific value of chlorate of potash in diseases of the mouth, that I was reluctant to discard my favorite remedy. My own conclusion was that, if the efficiency of chlorate of potash as an antiseptic was to be enhanced, a much higher concentration would have to be used.

From that time on I discarded all solutions and employed pure chlorate of potash in the form of a tooth-paste containing fifty per cent. of the salt.

In this manner I achieved much better results than before, not only in mercurial stomatitis, but also in all diseases of the mouth, occasioned by the formation of schizomycetes.

During the past eight years in which I have employed chlorate of potash in this modified form I never had occasion to look for a better cleansing agent for the mouth, tonsils, and teeth. Naturally I fully agree with Miller that the efficacy of this remedy does not solely depend upon its antiseptic value.

It is my opinion, that it possesses marked tonic properties acting favorably on mecurialized gums and imparting increased circulation. In many other affections of the mouth and tonsils the property of chlorate of potash of furthering secretions is particularly commendable.

To obtain this result the pure chlorate of potash must be used; a small quantity is spread on the tooth-brush, applied to the teeth and gums and rubbed to a paste. After rinsing the mouth with clear water, a somewhat salty, but refreshing taste remains.

I know of no other preparation that will remove so quickly and effectually the fœtor oris, which is most apparent after meals and upon awakening in the morning. A number of cases in which this fœtor proved sufficiently objectionable to enlist medical aid were promptly cured by the application of chlorate of potash, after the patients had been treated for internal ailments.

Chlorate of potash, being a neutral salt, has absolutely no detrimental effect on the teeth; if used in the concentrated fifty per cent. form, it will promptly check the growth of the fungi for a long time. and in many instances destroy them entirely.

Chlorate of potash having been declared a poisonous chemical, it is safer to employ in the form of a tooth-paste; thus the possibility of an accident is excluded.

It has been demonstrated that the daily use of chlorate of potash tooth-paste is the very best prophylactic against caries of the teeth and affections of the tonsils, including diphtheria.

GUAIACOCAINE CATAPHORESIS: OUTFIT AND TECHNIQUE.

BY WILLIAM JAMES MORTON, M. D., NEW YORK, N. Y.

So many inquiries have been addressed to me asking for information as to methods of procedure, that I gladly take the opportunity to answer them collectively through these columns.

Source of Current.—The "*continuous*" or "*constant*" electric current, whether obtained from the street mains or from any reliable battery, is the current required in cataphoric procedures. Alternating and pulsating currents are not practically available.

The "Edison Current," 110 volts, as in common use, requires a controlling device. The best is the "Wheeler Fractional Volt Selector." For controlling street main currents of a higher voltage than 110, special devices must be obtained.

As to a battery, a portable "red acid cell" of twenty cells, or any form of Leclanché cell, say thirty cells, or any other good battery, will answer every purpose.

Electrodes.—These devised and invented by the writer, are an "indifferent" or "dispersing" electrode and "active" electrodes. The small dispersing electrode is a circular disk of carbon, three inches in diameter, covered with two layers of sheet punk or amadou, bound at the edges by an insulated wire pressing into a groove.

This is large enough for use in cases of anesthetization of the gums or of sensitive dentine. For large areas of skin a larger dispersing pad electrode, say 6x6 inches, should be procured.

The active electrodes vary in shape according to the purpose to which they are put, but retain the special device of perforations to hold solution, etc. For the skin flat single plates of carbon or block tin of circular shape suffice. For the mouth in general a flat electrode resembling a mouth mirror is convenient.

For the gums, for use in extraction, implantation, etc., the electrode is made tong shaped and unlike any electrode of this shape formerly constructed; *both* plates are of the *same* polarity.

The carbon, or block tin, in the active electrodes is one-fourth of an inch thick, is perforated freely to about two-thirds of its depth by drill holes one millimeter in diameter, or is perforated completely and a shallow reservoir provided behind it to hold an excess of solution. The body of the electrode is of ebonite, raised two to three millimeters at the edges of the plates to form a cup into which is inserted a piece of soft and porous blotting paper cut to fit exactly, or a soft piece of felt or other absorbent material.

For sensitive dentine the active electrode is a small stiff piece of platinum wire tubular at its end, and perforated from the sides into the tube in order that it may hold an excess of the solution. Around the end of this "applicator" is wrapped a pledget of absorbent cotton.

This constitutes in the main all the electrodes necessary; modifications for special cases will suggest themselves.

Rheostat or Current Controller.—If the current from the street mains is to be used, preference has already been expressed for the "Wheeler Fractional Volt Selector." This same apparatus is equally available with a battery current. Its chief utility is in relation to sensitive dentine, where it is of highest importance that the initial voltage employed and current strength attained shall not cause pain. But in relation to the skin and mucous membrane any ordinary rheostat will answer the purpose.

Again, it is quite possible to one at all familiar with his "galvanic battery" to use the ordinary cell selector to bring into circuit a limited number of cells (thus working with a low voltage), and to regulate the flow of current from this small number of cells by aid of common water rheostats, provided that ample sponge tips break the strength of the first water contact.

An instrument like the fractional volt selector, however, saves trouble and annoyance.

Milliamperemeter.—Not only is it necessary to regulate the voltage employed, but also it is equally essential to have an instrument to record the rate of flow of the current attained. This, of course, varies according to the voltage, or, what is more important, according to the resistance, which in this case is tissue. This rate of flow termed "current strength" is measured in amperes, and in medical and dental work in thousandths of an ampere, namely milliamperes. A very small fraction of a milliampere causes pain in sensitive dentine. No reasonable idea of "dosage," nor means of comparison with other cases can be had without the record of a milliamperemeter. It is a constant guide to the administrator.

Any good milliamperemeter will suffice, but its scale should be large and easily read. An instrument recording from one up to ten milliamperes is preferable.

Solutions and Fluids.—Aqueous solutions of from four to thirty per cent. of hydrochlorate of cocaine may be used. The writer, by combining guaiacol and anhydrous hydrochlorate of cocaine, has found what seems to be a new compound rather than a solution. To secure uniformity of action (for some guaiacols are far more irritating than others), the solution or compound is termed *guaiacocaine.* It is a ten per cent. mixture of hydrochlorate of cocaine in pure guaiacol; this per centage may, if desired, be increased to thirty per cent. This solution as above given, answers every purpose perfectly for anesthetization of dentine and of the skin, but for use upon mucous membrane it should be diluted to at least one-half, or otherwise slight and superficial destruction of tissue may ensue. I use for dilution a ten per cent. solution of cocaine in glycerol, mixing it with guaiacocaine in equal parts. Guaiacocaine may be procured of McKesson & Robbins, New York, or at dental depots.

Technique.—Skin. Using aqueous solutions of cocaine, the skin must first be thoroughly washed with soap and water. When guaiacol is employed, this is unessential.

Mucous membranes.—No preliminary preparation of the mucous membrane is required.

As to the active electrodes, the solution is *first* dropped into the perforations until they are full; the absorbent material is then fitted to the shallow ebonite cup or wrapped about the applicator, and a liberal supply of the solution dropped upon it. It is now ready for use.

The flat electrode is applied directly over the spot to be anesthetized and pressed with some firmness against it, as, for instance, over a cancrum oris of a buccal surface.

In the case of the tongs electrode, some care is requisite to secure a proper adjustment and to secure uniform action. It is well, after the electrode is in place, to pack in absorbant cotton, not too wet with solution, to fill up inequalities of contact, or to bridge over (in certain cases) the gap between the blades.

For dentine, the cavity is first filled (a rubber-dam should be used) with a pledget of absorbent cotton dipped in the guaiacocaine solution (avoiding a surplusage and yet not too dry); the applicator itself should then be dipped in the solution until it holds all it can, and a small layer of cotton be twisted about its end. During treatment, the current may be turned off, possibly twice, and the pledget in the cavity be freshly dipped in the solution, or, as I prefer, by the use of my own applicator, this pledget may remain *in situ* and the fresh supply be furnished by removing and dipping the applicator itself into the solution; or, better still, a few drops of fresh solution may be from time to time dropped onto the tip of the applicator by aid of a pipette, thus avoiding entirely what is certainly objectionable, and that is any interruption of the flow of the current.

The dispersing electrode may be held in the hand, may be held by the operator upon the cheek or beneath the lower jaw, or placed upon the chest or back, or, in short, anywhere at a reasonable distance from the active electrode. The latter, the active electrode, is to constitute a positive pole, and the former a negative pole. To determine the polarity, apply a few drops of a saturated solution of iodide of potassium to a piece of paper and test the two terminals of the cords; free iodine will appear at the positive terminal and cause an iodine stain. Or test in the same manner by aid of a piece of litmus-paper wet with water; the positive terminal will turn the paper red, the negative will turn it blue.

Everything now being ready, the connections tested and polarity having been carefully determined beforehand, the current may be "turned on" most gently and gradually.

In the case of sensitive dentine, skill, carefulness, and experience are essential. The first onset of the current may at the best cause a slight burning pain. To avoid this contingency, it is well to give the solution five minutes' time to effect a superficial anesthesia prior to applying current. The applicator is adjusted, and the current, which cannot be too gradually applied, is then brought into circuit. The patient will feel a slight burning sensation, which in a moment will subside, when more current may be added. Each accretion of current during the first five minutes will cause the same sensation. Thus the treatment is followed up, step by step, consulting the patient as to the slight pain, until, in about five to seven minutes' time, it will be found that the current strength may be largely increased without causing any sensation whatever. At this time I carry the current up to from two to two and one-half milliamperes, and, after two to three minutes at this current strength, consider the dentine sufficiently benumbed to endure operative procedures without pain. A point of prime importance is to avoid movements or removal of the applicator during the current flow; for, as is well known, a "steady" current produces no reaction of motion or sensation, while a "varying" current produces these reactions most unpleasantly to the patient.

With these hints in mind and with a little experience, not only dentine, but the contents of the pulp-cavity, and even the tissues outside of the tooth, may be effectually anesthetized via the pulp-chamber. And it may be mentioned in passing that not only may anesthetizing substances be thus employed, but also any other remedy—germicidal, antiseptic, escharotic, etc.—which it is desired to apply to the tissues above named.—*Dental Cosmos.*

EDITORIAL.

Not long ago we were asked why it was that so many dentists, including some U. of M. graduates, were unable to make their occupation a financial success, and several cases were cited of men who are undoubtedly thoroughly proficient in their profession, but who as business men are sadly wanting. This is a question which each student should give special attention, for success depends not only on the practice established but upon the thorough business methods of the practitioner—his ability to collect his bills and promptness with which he liquidates his debts. It is an old saying that the professional man is impracticable in money matters, though why this should be it is difficult to say, for the practice of any profession is as much a business as the selling of any of the world's products, and subject to the same rules of supply and demand. Of all men engaged in active professional pursuits the dentist should be the most perfect business man, for not only is more of his time necessarily given to each individual patient, but expensive material is consumed in nearly every operation, the bills for which he must promptly meet if he would maintain his financial standing. May not the laxness of business principles in many dentists be due, in part, to the habits formed in college days, when there is seemingly no reason for the display of commercial ability, the money matters of the average student being confined to expenditures necessary for his education and comfort, and of which, generally, no very strict account is kept. The habits formed while in college undoubtedly remain with a person after his entrance upon the arena of the world's warfare, and the student who is indifferent or careless about contracting debts will be the one whose note is apt to go to protest, not, perhaps, because of any desire to defraud his creditors, but because of negligence and lack of proper business methods. Another reason why many practitioners are not a success, financially, is because of a repugnance in sending bills, when due, for services rendered. No dentist should feel it inconsistent with his professional dignity to call in person, if necessary, for the collection of a monthly or quarterly account, and a specified time upon which to mail or deliver statements to each person indebted to him should be part of the dentist's routine work. An elaborate set of books is not necessary for the accounts of the average practitioner, perhaps the more simple the system the better, but if every operation, however trivial, is tabulated, bookkeeping soon becomes a habit, making it easy to keep each individual account, and at the same time force the dentist into methodical and precise business habits which will augment not only his income but gain for him the confidence of the representative business men of his community.

Several members of the Senior class who are Canadians by birth have lately been corresponding with the Secretary of the Dental Examining Board of the Province of Ontario relative to the legality of practicing in that colony with a U. of M.

diploma, and have received in reply to their letters the statement that before being allowed to practice in the Province they must attend three years' lectures at some Canadian dental college. While the JOURNAL is heartily in favor of legislation to protect the people from dental quackery, this action on the part of our Canadian cousins seems to have been taken more in a spirit of jealousy and animosity than in a desire to place the profession upon a basis of liberality and unity. When it is taken into consideration that young men come from every part of the world to study dental science at Ann Arbor, and that most European countries receive our graduates with open arms, this attitude on the part of the Canadians is not only unjust but is belittling to the men who are responsible for the enactment of this law.

THE editor of the *Dominion Dental Journal*, under the title of "Halt," publishes a lengthy editorial in the March number on the congestion of the dental profession in Canada and appeals for a curtailment in the number of students graduated by the Canadian dental colleges. Evidently our Provincial brother has forgotten that the idea of the survival of the fittest is the only known method by which the profession can hope to grow and develop.

THE Freshmen are to be congratulated for the records made by the '98 men in athletics this year. The JOURNAL is proud of them.

DENTAL LAW IN CANADA.

THE following letter received by a member of the present Senior class explains not only why Canada is losing some of her best young men, but also gives an idea of the narrowness of our Provincial brethren in relation to American dental colleges:

DEAR SIR.—In reply to yours of 29th inst. I have to say, that, assuming you are a citizen of Ontario, to qualify as a dentist in this Province you will require to matriculate in the Royal College of Dental Surgeons of Ontario, sign indentures as a student of Dentistry with a licentiate for three and one-half years, attend three courses of lectures in the R. C. D. S. and pass all the prescribed examinations. In other words comply with the full curriculum of Ontario. If, however, you attended one course of lectures in Ann Arbor before March 25th, 1893, when the law here was changed, you will require to matriculate in the R. C. D. S., attend one full course of lectures and pass a final examination in all the subjects of the second and third years.

Yours very truly,

J. B. Willmott,

Secretary Royal College of Dental Surgeons.

P. S. Our Board is not now offering any inducements for the dental students of Ontario to take their professional training out of the Province.

MICHIGAN STATE BOARD OF EXAMINERS.

The next meeting of the State Board of Examiners in Dentistry for the State of Michigan, will be held in the City Council Chamber, in the City of Saginaw, E. S., on Tuesday, May 5th, 1896, at 10 o'clock A. M.

All "temporary licenses" expire on above date and cannot be renewed.

"Graduates of Dental Colleges, with a course of instruction and practice fully equal or equivalent to that of the College of Dental Surgery of the University of Michigan" can be registered by furnishing the necessary affidavit, and paying the fee, $3.00. All others are required to pass an examination before the board.

Applicants for examination must furnish instruments, including dental engine and sufficient gold for one or more fillings. By order of the board.

Frank O. Gilbert, Secretary.

Bay City, Mich., March 28th, 1896.

MICHIGAN DENTAL ASSOCIATION.

The Fortieth Annual Meeting of the Michigan Dental Association will be held in the city of Grand Rapids on June 10, 11 and 12. It is hoped that a large attendance will be had, and from present prospects it will be the most enthusiastic meeting held for years.

B. H. Lee, D.D.S., Secretary.

J. Ward House, D.D.S., President.

THE NEW CALENDAR.

THE new Calendar for the college year of '95–'96 has just been issued. In its pages we find a new and complete list of graduates with their locations (so far as known) including the class of '95. A copy will be sent to each alumnus before the close of this year and it is hoped if there are any omissions or errors notice will be given at once.

BOOKS RECEIVED.

Electricity in Electro-Therapeutics.—By Edwin J. Houston, Ph.D., and A. E. Kennelly, Sc.D. New York: The W. J. Johnston Company.

This little book is intended to meet an evidently growing demand, not only on the part of general medical practitioners, but also of that of the general public for information respecting such matters in the physics of electricity applied to electro-therapeutics, as can be readily understood by those not specially trained in electro-technics.

Catching's Compendium of Practical Dentistry, 1896.—By B. H. Catching, D.D.S. Atlanta: G. Franklin, Printing and Publishing Company.

This valuable review of all that is interesting and instructive in dentistry for the past year is now on sale and should be in the hands of all dentists, and especially in the libraries of the young men about to leave college. A new feature has been added to the Compendium this year—Science in Dentistry—making the work a complete one in every detail.

ALUMNI NOTES.

Dr. Milton T. Watson, '93, of Bay City, spent March 30th at the college.

Dr. Mason Moyer, '93, of Dundee, Michigan, called at the college on March 31.

Dr. R. D. McBride, '93, has resigned his position as lecturer on crown and bridge-work in the Detroit Dental College.

Dr. J. Austin Bucknall, '95, of Detroit, spent April 26th in the city visiting college friends.

A report reaches us that a son was born to Dr. and Mrs. E. L. Gedney, members of the class of '94.

B. T. Ruthruff, D.D.S., '95, of Huron, Ohio, visited the college and Ann Arbor friends last month.

A recent letter from Dr. G. W. Collins, '94, of Vermillion, South Dakota, tells in a general way of his prosperity.

The report that Dr. Fred Sizelan, '90, of Muskegon, was to leave that place for London, England, proves to be false.

Dr. F. D. Wilson, '81, of Omaha, Nebraska, is visiting with Dr. Dorrance for a few days, before leaving for Atlanta, Georgia, where he will locate for the future.

About March 27, Dr. Walter J. Bell, '92, of Ishpeming, Michigan, spent three days in the city. The death and burial of his sister was the cause of his stay here.

Geo. A. Servis, D.D.S., '94, formerly of Standish, Michigan, has purchased the practice of Dr. F. A. Kotts, Manchester, Michigan, Dr. Kotts having located in Toledo, O.

Because of weakness of his eyes, Dr. A. W. Diack, '92, has discontinued his course of lectures on Dental Materia Medica for the present year, at the Detroit Dental College.

During the early part of March, Dr. D. N. Swift, '94, of Buchanan, Michigan, was called for a few days to this city by the death of his daughter, aged 15, who had died of congestion of the lungs.

Dr. Clarence F. Piper, '95, of Toronto, Ontario, made a few days' visit about the college and in the city on April 26 and 27. Dr. Piper has taken the examination at Toronto for admission to practice in the Dominion, but will not know until in early May whether he has been successful or not.

Dr. Abban V. Elliott, of Florence, Italy, who was president of the class of '81, has been recently elected to the presidency of the "Societa Dentistica Fiorintina." Dr. Elliott has been a regular subscriber to the JOURNAL since its establishment in '92, and it is with pleasure it makes note of this honor conferred on him. Eastward the course of American ideas take their way.

DEPARTMENT NOTES.

J. P. Collett, '96, will practice at Celina, Ohio.

A diploma was conferred upon W. P. Winning April 10.

C. L. Sherwood, '96, has decided to locate at Titusville, Pa.

E. W. Brown, '96, expects to practice his profession in Saranac, Michigan.

J. M. Duffy, '98, won the hand walk and the hurdle race in the 'Varsity indoor meet.

C. K. Medler, '98, underwent a minor surgical operation during the spring vacation.

Work on the ladies' gym. is being rapidly pushed, the foundation being already in place.

Dr. Watling lectured to the Seniors on the evening of April 8 upon the subject of "Extraction."

A. H. Kimmond, '98, has been selected as one of the catchers for the 'Varsity base ball team.

Miss Jennie Bailey, a Sophomore Medic, has changed to the Dental Department, entering the Freshman class.

A. W. Schurz is a late entry in the Junior class. He comes from the Medical department of the Northwestern University.

Most of the commencement invitations have been received by the chairman of the invitation committee, H. J. Livingston.

F. M. Bacon,'96, will occupy an office in Port Huron during the summer. Whether he will stay longer he has not yet fully decided.

The Seniors and Juniors are busy preparing their papers to be read in Dr. Taft's lecture hour, he having given out subjects last month.

The Freshman class, under Dr. Haidle, has completed its first course in the laboratory and has now taken up crown and bridge work.

Since our last issue B. T. Hunt, J. W. Lyons, W. H. Butolph and E. V. Deans, all of the Senior class, have recovered from attacks of parotitis.

The last class in dissection is at work in the anatomical laboratory. The spring course compels attendance on Saturdays and every day during the spring vacation in order to comply with the state law which prohibits such work after May 1.

During the spring vacation the chimney in the demonstration room was overhauled, thereby improving the draught for the Land furnace.

Through the kindness of Herman Printz, '96, we are enabled to print a translation of "Chlorate of Potash as an Antiseptic," by P. G. Unna, M. D.

Mr. Sheldon, a former student of our department, and now a member of the class of '96 of the Detroit Dental College, made Ann Arbor friends a visit in March.

A. H. Kinmond, '98, had the misfortune recently to receive a broken nose, being struck in the face by a wild ball as he was watching some students practice in the Gym.

Lambda chapter of the Xi Psi Phi fraternity was organized in Chicago the first of March by C. F. Fitch, '96, assisted by Drs. G. F. Fiddyment, '95, and O. F. Ingalls, '92.

Several students of the department passed their spring vacation at Whitmore Lake and their veracity must not be questioned when they tell of the fish they caught.

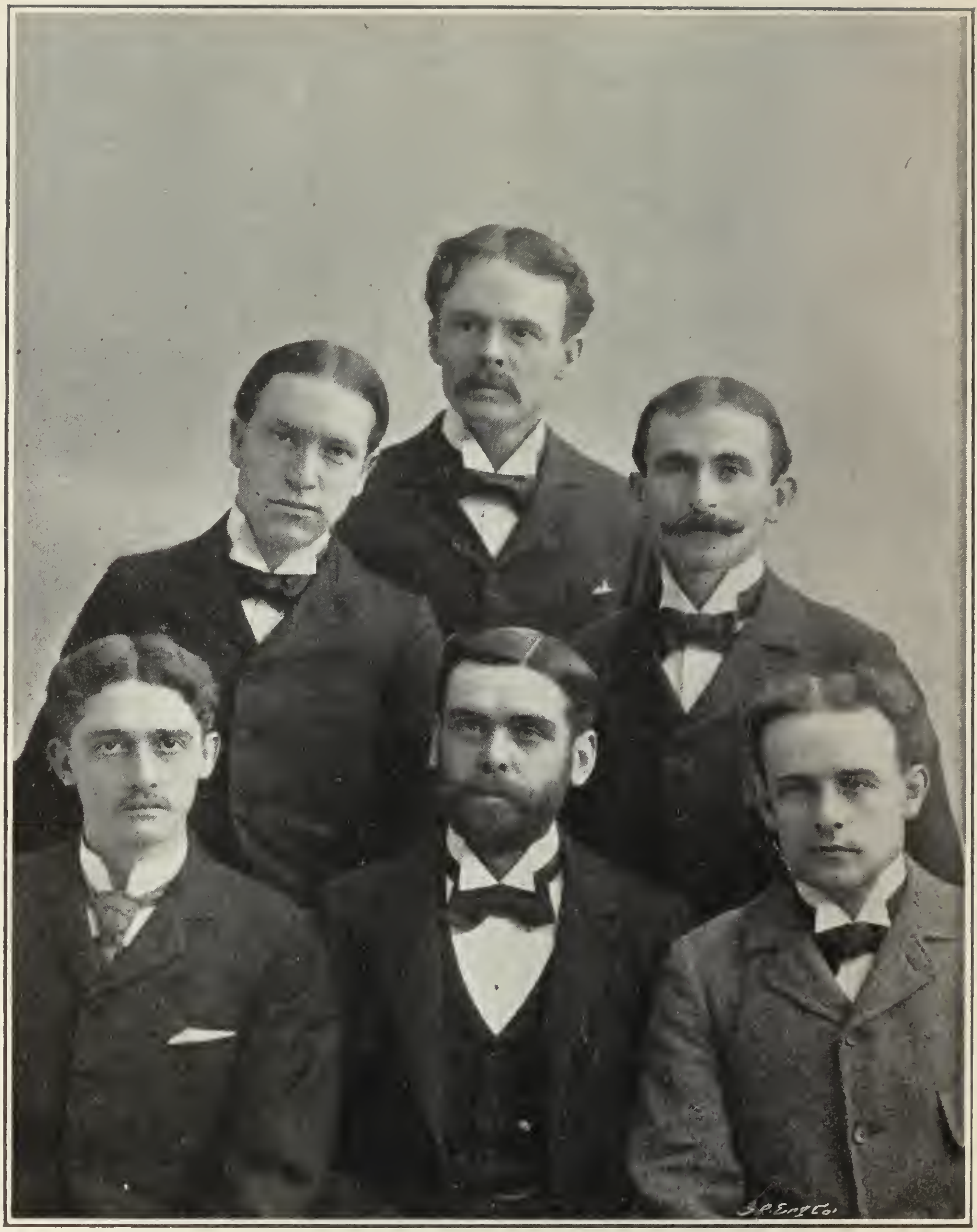
The Seniors have decided to have a class album instead of a group picture. The album will have six faces on each page and will be a valued souvenir to the members of the class.

Dr. Watling has commenced marking the Seniors on their operations, and a standard of seven and one-half of a possible ten in thirty gold fillings must be reached by the aspirant for a diploma.

C. F. Fitch, '96; J. C. Blair, '97; C. E. Pease, '98, and C. F. Steinbaur, '98, were with the Glee, Banjo and Mandolin Clubs on their trip during the spring vacation, going as far west as Salt Lake City.

The class of '98 has a ball team in the field which is bound to do good work. R. N. Forbes is the manager. The JOURNAL wishes the team all possible success and hopes the nine will be as victorious as the relay team has been.

At the last indoor meet at the gymnasium the dental relay team, composed of A. H. Kinmand, L. N. Burke, R. N. Forbes, and J. M. Duffy, all of the class of '98, won the trial relay race from the '99 Lits in 57 3-5 seconds; from the '99 Medics in 57 seconds; from the '98 Lits in 57 1-5 seconds, and from the '98 Laws in 56 1-5 seconds, in the last lowering all previous records.



BOARD OF EDITORS.

RALPH L. WILLIAMS, '96.
HARRY D. WATSON, '97. A. W. HAIDLE, D. D. S., '92.
LESTER GEORGE, '98. C. E. BAILEY, '96. S. K. SCHARLOTT, '97.

THE DENTAL JOURNAL.

Published Under the Auspices of the Dental Society of the University of Michigan.

VOL. V. JULY, 1896. NO. 4.

IMPRESSION MATERIALS, AND HOW TO USE THEM TO ATTAIN THE BEST RESULTS.

BY C. A. DEVLIN, '96.

It is not the intention of this paper to go into detail in regard to all of the impression materials which are in use at the present day, but rather, that one which is without doubt the best, and which is most universally used, namely, plaster of Paris.

It is said, and most truthfully, that a perfect impression and a correct articulation, constitute the basis of prosthetic dentistry. On no other basis can a denture be constructed, which embodies the highest ideas of utility and beauty. Given an imperfect impression, the most accurate workmanship avails little or nothing, and the most artistic mechanism is all the more disappointing to both patient and operator. As it is the intention of this paper to deal with plaster of Paris, and plaster impressions, it will be well to approach the subject in a systematic way.

Let us first consider what the essential qualities are in a good impression material. There are two principal ones: It should have the necessary softness for taking the impression, and the proper hardness for retaining its shape when being removed.

The essential properties are the following: It must take a sharp imprint, must remain where placed, must harden promptly, and when there are undercuts or dove-tail spaces it must either bend or break with moderate force. All materials must not only have these essential qualities, but they must be available under the conditions existing in the oral cavity; and besides, they must have no qualities which are repulsive to the patient.

The material must be soft enough to copy the finest lines of the mucous membrane, and at the same time must have that consistency which will compress, without displacing, the soft tissues. 'Remaining where placed' implies that the material must not only have no tendency to warp or fall away of its own weight, but that it must have the least degree of expansion or contraction. The property of hardening is as essential to the removal as that of softness is to the taking of an impression. When there are undercuts or dove-tail spaces no correct impression can be withdrawn without either bending or breaking; and any material must yield or fracture with moderate force, or too much pain and injury will be inflicted. As the taking of an impression is generally an unpleasant process, and sometimes not a little painful to the patient, it should be taken in such a manner as to give the least degree of pain and annoyance.

Materials: The impression materials in use are, wax, gutta percha, modelling compound, and plaster of Paris. The two latter materials have the greatest number of desirable properties, and are most extensively used, so let us consider plaster of Paris.

Plaster of Paris, or gypsum, is a calcium sulphate ($CaSO_4 2H_2O$) which is prepared for dental and other purposes by being pulverized and calcined. Exposure to heat drives off the water of crystallization, which mixing again supplies, restoring the plaster to its original condition of solidity. It is claimed that if the proper quantity of water be taken, the plaster will be almost as hard as the original gypsum. Only the best quality of plaster should be used for dental purposes, and, as all its desirable properties are damaged by exposure to moisture it should be kept in a dry, warm place. Assuming that the plaster has been properly prepared and has not been exposed to moisture, there is one essential condition that must be complied with to obtain the best results: it must be properly mixed. Of the several methods of mixing plaster, that is best which most perfectly excludes or removes all air-bubbles, prevents expansion, and, when used for that purpose, gives the sharpest and smoothest impression. When mixing plaster, the following points, which anyone can easily prove by experiment, should be borne in mind: 1st, plaster mixed very thin or very thick, or stirred too long, will set soft and expand decidedly, an excess of water, plaster, or stirring, interfering with perfect crystallization; 2d, though coarse plaster sets hard, it expands too much for dental purposes; 3d, substances used to hasten its setting always soften plaster, and should be used for impressions only; 4th, plaster sets most perfectly and promptly in warm water. The best vessel to mix plaster in is a small bowl, for the reason that in such a vessel the mass can be stirred more quickly and thoroughly. The air which is always found in plaster should be freed before the latter sinks into the water. It is needless to say that this cannot be done by pouring the water on the plaster, but can best be accomplished by sprinkling the plaster into the water. Plaster will usually be found more or less packed in the can or barrel, and should first be loosened up to free the air from the mass, and then sprinkled into the water by tapping the spatula on the edge of the bowl, which may at the same time, and also while stirring the plaster, be jarred on the table. Sprinkle in the plaster till all the water is taken up, or, when sufficient plaster has been added, pour off the surplus water. The stirring should be brief, rapid and thorough.

As to the chemistry of plaster. Prof. Henry Leffman gives the following points: "The setting of plaster is a chemical process, the water being taken up in the proportion of two molecules to one of the calcium sulphate; that is, $CaSO_4$ becomes $CaSO_4 + 2H_2O$. The facility with which the combination occurs depends largely upon the care which has been taken in preparing the plaster. If it has been too highly heated, the power of taking up water is lost. The presence of impurities also of course interferes with the setting qualities. It is well known that many saline substances—e. g., common salt—hasten the setting, but the exact cause of this is not definitely known. In the case of common salt a double composition occurs to a slight extent, by which calcium chloride and sodium sulphate are formed. When a solution of the so-called liquid silex, which is sodium silicate, is put on a plaster cast, a similar reaction often occurs, forming sodium sulphate and calcium silicate, and the sodium sulphate appears on the surface of the cast in white moss-like tufts.

The hardening of calcium sulphate is attended by the production of heat and by increase of bulk. The best casts are, of course, obtained when the mixture with water is made thoroughly, so that every particle of plaster has an opportunity to absorb the proper amount of water."

Of the various substances that have been used to hasten the setting of plaster for impressions, common salt is the least objectionable and answers every purpose. From five to ten grains is the proper quantity for the average impression. To secure uniform diffusion, throw the salt into the water before sprinkling in the plaster. Salt hastens the setting, makes the plaster brittle, and, it is claimed, reduces its expansion, each effect being a decided advantage when taking an impression. If salt really prevents expansion, it is a most valuable addition to the plaster. The brittleness induced by salt lessens the amount of force required in fracturing undercut and partial cases.

Objections to plaster: Plaster is disagreeable or difficult to use in proportion as its qualities are disregarded or it has not been kept within proper limits. And, because it will not readily accomplish everything, some who have not used it properly, or but for a short time, seem inclined to replace it by the materials which, though apparently requiring less skill, are seldom or never so reliable. As many objections to plaster, and much prejudice against it, come from using it improperly, it will be necessary to enter into some, perhaps, apparently unimportant details in describing methods which secure the desired results with the least annoyance to the patient and the best chances of success to the operator. The too common plan of taking a cup that will simply enclose the ridge, paying no attention to the height of the palate, and piling the plaster high in the center, is a good way to choke the patient, spoil the impression, and furnish a strong argument against plaster. And having it mixed so thin that it will drop on the patient's clothing, or so thick that the parts cannot be imbedded, or using such a quantity that there is an overflow into the mouth and fauces, are mistakes that are certain to cause failure and loss of reputation.

A perfect impression and its tests: A perfect impression must have fullness, smoothness and sharpness. It should cover a little more surface all around than the finished base-plate; faithfully reproduce all the finest lines, and should be as smooth as the mucous membrane. The sharpness is required not only to attain the best adhesion, but to counteract as far as possible the blunting effect of cast-varnish. Smoothness is necessary to the health of the surfaces against which the plate rests. A full impression adheres to the parts it covers, either because the air is excluded from under it, or on account of alveolar undercuts, or because by being left in too long it has absorbed the moisture from the mucous membrane. The latter effect is generally due to ignorance or carelessness, and usually injures the mouth. The resistance which occurs from pressure of the atmosphere against the under surface of the cup, showing that the air is excluded above, can always be relied on as the *certain test of a good impression.* The resistance which is offered by an undercut can easily be distinguished from that of the atmosphere, and is nearly always felt after the latter has been overcome. Of course it is admitted that an impression which drops when touched or is detached with very little force may be so modified as to produce a plate with fairly good adhesion; but such an impression cannot be considered reliable in any case, and in difficult ones it is almost wholly worthless.

Methods of taking plaster impressions: The best attainable results with plaster are secured when the required quantity of properly-prepared plaster is placed in a cup exactly adapted to the case, and pressed up with the rear slightly in advance of the front. The only objection to passing up the heel of the cup in advance is the liability of confining air between the plaster and the palate. Theoretically this seems to be a strong objection, but practically it amounts to but little. And even when air is so caught, the defects appear on top of the rim, usually above the plate-line, being carried there by the outward flow of the plaster.

When the soft palate is too irritable to permit contact without retching, local or constitutional treatment should be resorted to before attempting to take the impression. Perhaps the best local treatment consists in manipulating the parts with a feather or with some suitable instrument. As a constitutional remedy some operators recommend bromide of potassium, which should be administered about an hour before taking the impression. Local applications of cocaine will also diminish the irritability of the parts. But even when the soft palate is sensitive, retching can generally be prevented by keeping the plaster on the hard palate, which is done by having a line or ridge of wax across the heel of the cup. The plaster can be kept in front of this line in most full, and all partial cases, thus copying the surface very little farther than it will be covered by the plate.

It is the writer's opinion, that if this method of protecting the soft palate, and at the same time keeping the plaster out of the mouth, is properly applied, treatment of any kind will very seldom be required. This method and its other advantages will be described in detail.

Special cases sometimes require such extensive cutting away of the rim or floor of the cups as to render them unfit for further use unless these parts are restored with wax or modeling compound. When necessary, never hesitate to sacrifice a cup if by that means a more perfect impression can be obtained. The rim of the cup must not be so high as to stretch or displace the soft parts connecting the cheek with the ridge. When the ridge is short or low, the rim of the cup must be narrow. The two worst faults a cup can have are to be narrow at the rear and too high in the palate. The ridge, or, in partial cases, the ends of the teeth, should always rest on or almost touch the floor of the cup, because in that way even a nervous hand can hold the impression steady. As a general rule, plaster should have least body or thickness where the parts are most yielding, in order to secure positive and uniform compression. In view of many ill-adapted cups in use, and the excessive quantity of plaster often employed, it is somewhat remarkable that serious accidents do not frequently occur in attempting to take plaster impressions. The most important rule that can be given for the use of plaster is this: *keep it on the cup.* In order to do this it must not be mixed too thin, the proper quantity must be taken, and its flowing or being forced into the mouth must be prevented. When introduced into the mouth the plaster should be so stiff that it will not drop from an inverted cup. When the cup is made to conform to the size and shape of the parts, the quantity of plaster, which is thus reduced to the minimum, is easily estimated. As the palatine portion of very few cups can be so bent as to conform exactly to the roof of the mouth, a wax impression of the palate should always first be taken, a layer removed to give room for the plaster, and a line left intact across the rear to limit its flow. In most undercut and all partial cases this wax palate must be securely attached to the cup by warming the adjoining surfaces with dry heat, and the plaster must be anchored to the wax by undercutting the latter and chilling it in cold water. If any of these points are neglected, the cup and the wax, or the wax and the plaster will part company, and failure will almost certainly be the consequence.

The advantages of a wax palate, given at length and in their proper order, are these: (1) It measures the height and gives the exact shape of the parts, thus enabling the operator to estimate the proper quantity of plaster; (2) it makes the taking of the palate a certainty, with the least risk of the plaster being pressed against the soft palate or falling into the mouth; (3) it aids in adjusting the cup, which should always be pressed up with the second finger in the center; (4) it secures uniform compression of the soft tissues; (5) by being scored and undercut it anchors the plaster securely to the cup. And, besides these advantages, this wax palate when softened enables the operator to remove the model and the impression from the cup together. Each of these is an important point, and the last is not least, since it is the only reliable method of separating undercut and partial cases. This simple and efficient method of taking all upper impressions, full and partial, needs only to be tested to be adopted, but all the points must be noted and complied with or it will not prove satisfactory. If the cup be prepared in this manner, there will be no occasion to use cups with movable palates to press up and anchor the plaster, nor will it be necessary to make dies and swedge cups for special cases.

The extent of the space between the cup and the roof of the mouth will determine the mode of procedure. If this space is less than one-fourth of an inch, place a strip of wax about half an inch wide across the heel of the cup; if the space is more than one-fourth of an inch, take a wax impression of the entire palate. In both cases make the wax quite soft, and, being sure that the cup is in proper relation to the parts, press up until the floor touches the ridge; remove and trim away from the wax a layer of about one-eighth of an inch to give room for the plaster. In all cases a ridge of wax two or three lines wide should be left across the rear. This, by running the plaster to an edge and limiting its flow backward, thus forcing it against the palate, constitutes one of the best methods that can be devised for compressing the soft tissues.

After preparing the cup and having everything at hand, some points remain to be noted and certain directions must be given to the patient. As already directed, note the condition of the oral secretions. It is almost always some advantage and often a necessity, to rinse the mouth with a solution of alum or salt. When the mucous membrane is soft, spongy, or diseased from the previous wearing of a plate, a tonic and astringent mouth wash should be used for several days or weeks before taking the impression.

Some operators claim that the patient should be directed to avoid swallowing while the cup is in the mouth, but it is probably better to say nothing in regard to this, as the mere mention of it would, on highly sensitive patients, cause an immediate and constant flow of saliva, and so render swallowing imperative. The breathing may be safely allowed to take care of itself. As soon as the cup is in the mouth request the patient to lean the body and head forward, and when the cup is in position to draw down the lip.

If the cup has the proper shape and the right quantity of plaster has been employed, it is not especially necessary for the patient to lean forward, but nothing can press the plaster against the ridge all around at the same time so evenly and positively as drawing down the lip. In addition to this, pressure with the fingers may be made at the front.

Never attempt to remove a full impression until the plaster will fracture without crushing. A partial impression may sometimes be started a little to loosen it around the teeth and enlarge their imprints before it reaches that degree of hardness, though there is generally a more excellent way. By pressing between the thumb and finger plaster that has just reached the fracturing-point, it will be seen that it can be easily crushed. To know when it is hard enough, test the plaster in the bowl, or, better still, the surplus which has flowed over the front of the cup, as this more truly represents the condition of that in the mouth.

When the cup is properly shaped place the plaster around its floor, making it thin on the palate, high on the corners, but highest in front; so that when pressed up the surplus will be forced over the rim and not back into the mouth. In this way the plaster is placed just where it is needed, and the worst annoyance to the patient is prevented.

The manner of introducing the cup into the mouth is the same as for other materials, but when using plaster more care is necessary to avoid displacing it with the lips or remaining teeth.

The mouth should be opened just wide enough to admit the cup and contents, so as to allow of its greatest lateral distension. This is especially necessary when the mouth is small and the jaw relatively wide. The right side of the mouth is pressed away with the corner of the cup, the left side distended with one or two fingers of the left hand, when the cup is passed in, and then with the second finger in the centre and the rear a little in advance it is forced up with firm and steady pressure, until increased resistance shows that the ridge has touched or almost touched its floor. Now request the patient to draw down the lip, or draw it down yourself, when pressure can be made with the fingers at the front above the rim of the cup. While the plaster is setting the cup must be held perfectly steady, the least movement being liable to damage the impression.

An impression usually hardens in three or four minutes. It should be so hard that it cannot possibly crush, but it must not be left in so long that by absorbing all the moisture it will adhere to the mucous membrane. As there is a degree of softness which produces the best impression, so there is a degree of hardness which allows of the easiest and safest withdrawal. As before stated, the most reliable test of a perfect impression is the resistance to its removal. Many full upper impressions will adhere with decided tenacity, and will sometimes resist even forcible attempts to dislodge them. Though a plaster impression when set must be removed promptly to prevent its adhering to the membrane, yet nothing results from too much hurry or from applying an undue amount of force, except pain to the patient and damage to the impression. By raising the lip and the cheek at the front and sides to admit air, and so break up adhesion, and at the same time elevating and depressing the handle of the cup by short rapid movements, the impression is easily and safely detached. In case of difficulty the air may be admitted at the rear of the cup by pressing up the soft palate with the finger or the end of a blunt instrument; or the patient may be directed to give a slight cough, which, by raising the soft palate, admits the air under the impression.

In some cases, which perhaps are rare, it will be necessary to detach the impression the moment it can be done without crushing; otherwise the moisture will be absorbed, and the membrane, by adhering to the plaster, will be more or less lacerated.

SOME RECOLLECTIONS OF THE CLASS OF '96.

BY H. HILLMAN, '96.

To begin at the beginning, I suppose that most of us after having paid our matriculation fee and interviewed Dr. Hoff started out to explore the building with which we were afterwards to become so familiar, rejoicing if we got off without an entrance condition and growling and kicking if we did not. Then we stood around in groups and wondered about getting acquainted with our classmates and trying to pick out a congenial bench-mate.

After this came the assigning of benches and it was right here that we first became acquainted with Dr. Haidle. Then followed our introduction to the various dental supply agents and the purchase of our freshman outfit and the arrangement of the same.

In a surprisingly short time we had settled down to the steady routine of work as laid out on the schedule. And perhaps the most memorable thing about the first few lectures was the kindly way in which the juniors sought to make us feel at home. I refer to the pleasant custom of "helping" the freshmen to their seats. We all remember seeing some poor belated freshman stealing on tip-toes to his seat and fondly hoping to get there unobserved, but he was always quickly caught sight of and vigorously "helped" by a score or so of obliging juniors, and when at last he got to his seat covered with confusion and dropped into it with a sigh of relief he was usually almost lifted out of it again by the resounding thump which ended the interesting performance.

And when in return we tried to "help" a junior in a similar manner we were often beautifully fooled at the last moment by his clever feint of dropping into his seat and then immediately straightening up and quietly dropping down after it was all over. But we were not caught that way more than once or twice.

They also had a way of greeting any tardy member by a shower of shouts, such as, "There he is—that's him!" "We knew he'd come!" This too, to a modest and retiring man was sufficiently embarrassing for the first two or three times at least.

Our first few weeks work on taking impressions will be remembered, and especially the time we had when we came to the plaster, the variety of attitudes and expressions to be seen were truly striking. In the demonstration room we grew better acquainted with Drs. Hoff and Haidle every week and got many good points from their skillful manipulations.

From the beginning we were kept busy both in the laboratory and the lecture rooms and most of the time was given up to real hard work varied by an occasional joke in the lab, or the "pulling a man up" in the lecture room, till, almost as a surprise we found ourselves preparing for the end of the semester. And soon our first "star chamber" in osteology was passed, then the final written exam in general chemistry, and the first semester was over.

The second semester to most of us, I suppose, is remembered as the period of hardest work in the course and in it dissection, histology and qualitative chemistry took prominent places, but this too passed very rapidly and the first long vacation came around bringing with it the end of our freshman year and a well-earned leisure.

Our coming back as Juniors was a very pleasant reunion and very few of the original number were missing. Besides renewing our acquaintance with Drs. Hoff and Haidle we now made the acquaintance of Dr. Hall in his interesting and instructive course in Dental Anatomy. And it was not till now that we really came to know and appreciate Dr. Dorrance, his genial disposition and his wonderfully skillful fingers will never be forgotten, his handling of wire especially always seemed to us to smack of magic. This year is also marked by our first lectures from our worthy dean, Dr. Taft, and it was now that we began to feel that we were really dents and not more than half medics. The only course for which we had to leave our own building this year being that of Physiology. During the first semester of our junior year occurred the memorable rush with the freshmen which resulted in the carrying away of the lecture room doors and of considerable damage to the plaster in the neighborhood, and also in a class tax for the repair of the same.

But there is no doubt that the freshmen were much benefitted by their defeat and should in justice have been assessed for the repair of damages.

The interesting course in bacteriology which closed with the end of this semester was much marred by the brutal way in which we were compelled to stand around in a bare hall for two or three long afternoons waiting for our star-chamber, and all for lack of a little consideration and forethought on the part of the professor who had charge of that course.

In notable contrast to this mode of management, or rather, of mismanagement, was the careful and thoughtful way adopted when the time came at the end of the year to take our final star in physiology. It was held under the old hickory tree just beside the Medical building and each one of us was given a card with the day and hour of our appointments noted on it, and considering the large size of the class these were kept with wonderful accuracy, and the members of the class were thus saved a great deal of unnecessary anxiety, annoyance and loss of time.

This was the last act of our junior year and the class quickly dispersed to meet again in October as Seniors.

Almost the entire class returned with the addition of several members from other colleges. We found Messrs. Bigelow, Bush and Roberts right on hand to greet us as usual, and very glad to see us. After selecting our chairs and buying our Senior outfit we soon got acquainted with Dr. Watling and his little sharp-pointed instrument and his equally keen criticisms, which, though no doubt intended to be strictly flattering and confidential always seemed to us to be spoken in a voice loud enough to be heard at Ypsilanti, but even this was more than compensated for when he shoved in his mirror and passed on without a word, or, better still, with a "Well done, go ahead." We were also glad to renew our acquaintance with Dr. Hall and to find that Dr. Neeley had returned to assist in the operative clinic.

Our first struggles with leaking dams and gold that "wouldn't stick" were a good deal aggravated by the short winter afternoons and the total lack of any adequate artificial light in the operating room. We were led to hope that this lack would be supplied during the Xmas vacation but the improvement was so slight as to be hardly worth mentioning, and we were all glad when the days began to grow longer. Mr. Purfield, popularly known as "Henry," who always "wanted the room" in our other years was very accommodating this year to those who happened to be occasionally belated owing to a long and difficult filling. It would be hard indeed to find a person to fill his position as efficiently as it is now filled.

Our first intimation of the rapid passing of our last year was the agitation of the subject of a class picture early in the spring. A class cane had been decided on and purchased early in the year. The picture question was finally settled after much discussion by deciding on the framing the single photos in a large frame as had been done by former classes, instead of a group picture as was suggested. A class album was also contracted for so that each member could purchase one and so save the expense involved in exchanging photos.

Dr. Watling's exceedingly instructive and practical lectures ceased with the Spring vacation with an interesting and exhaustive talk on "Extracting."

The beautiful days of May and June slipped very rapidly away and one morning we found Dr. Hoff calling the familiar roll for the last time.

No more shall we hear the well-known roll call, Argetsinger, Arnold, F. C., J. C., Bacon, Bailey, Bass, E. W., E. D., and so on down the list.

No more will Bass answer "present" from somewhere out by the fountain; Bucks "pretty bird" will be heard no more; Sheridan will be more than "twenty miles away;" Ross and his box will depart from the old familiar spot, and the class of '96 will in all probability never come together again.

This short article would be very incomplete without some reference to our only lady class-mate, Miss Jessie E. Castle, who has been with us throughout, and whose unfailing cheerfulness and good nature have won the respect and admiration of the whole class.

These are but a few of the recollections of the class of '96; no doubt every member will long remember and recall many pleasant incidents which will help to keep a warm corner in their hearts for the U. of M. and especially for the faculty and members of the class of '96.

The Ann Arbor edition of the *Headlight* has just been issued. It is replete with illustrations of college buildings, fraternity houses, residences and professors, and makes a beautiful souvenir.

GALVANIC ACTION BETWEEN GOLD AND THE BASE METALS USED FOR FILLING TEETH.

BY J. P. COLLETT, B. S., '96.

Only within the last decade has there been any attention paid to the galvanic or electro-chemical relations of filling materials to each other and to tooth structure, the existence of such relations having been previously ignored. And today we find some men of prominence who are prone to believe that galvanic currents have little, if anything, to do with causing decay about fillings, while others are equally as certain of the evil effects of galvanic action. Out of this confusion of ideas and teachings, we must trust to science to bring harmony, to cause principles to be recognized, and the strong walls of prejudice to be broken down.

What we most desire to know is, "What are the conditions requisite to produce the best results with any or all the materials with which teeth are filled?" Aside from perfect workmanship, success or failure is the result of law; conditions and combinations determine the end.

There must be adaptation of special materials to different conditions of tooth structure; now how best use these? The introduction of any filling material which is a good conductor of the galvanic current introduces an element of electrical disturbances as true to law and as positive in results as when a copper and carbon plate are immersed in a cell containing the proper fluids for producing galvanic action. As far as tooth substance is concerned the evil disturbances must be in proportion to the galvanic disturbance, and whatever the result may be it is in accordance with natural laws, a knowledge of which will greatly aid the operator in applying the material best calculated, all conditions considered, to give the best results.

We may learn from observation and practice that teeth of normal structure and density under favorable conditions and, when properly filled with gold, may last a life-time, thus defying all the agents of decay. Unhealthy or abnormal secretions, lodgments of food, and acids produced by fermentation, lack of cleanliness, excessive use of acids, etc., produce, or generally lead to, decay. Aside from these agencies there are two other causes that produce secondary decay. The first is a deficiency of the elements (phosphates and carbonates) which in a degree render dentine a non-conductor. The second is defective manipulation of filling material, which admits moisture between the filling and the walls of the cavity. Primary decay depends on the quantity of electric fluid passing, while secondary decay depends on nature and quantity of agents set free by the former.

Through the agency of galvanic decomposition of food fluids in the mouth, and organic constituents of tooth-substance, there is an increase of acids above that which would occur with non-conducting fillings. But teeth of normal structure are never decomposed by true and simple electrolysis. Changes in structure must occur before decomposition can take place, and these changes are produced when the teeth are subjected to the action of acids, which remove the non-conducting carbonates and phosphates; the remaining organic matter is a conductor, and like organic compounds is decomposed by the galvanic current. Acids eliminated by such conditions react upon the lime constituents of the teeth, thus promoting the decay.

Metallic fillings under favorable circumstances add a new element or factor for the increase of acids. The filling of any conducting material forms the negative element, while the organic constituents of the tooth-structure make up the positive element. Dentine, when dry, is a non-conductor, but in the condition in which it is always found in the mouth is a conductor by reason of its organic structure and the presence of moisture. The decomposing effects are in proportion to the strength of the current, which is increased or decreased by the distance between the positive and negative elements. The feeble currents require time in proportion to their weakness.

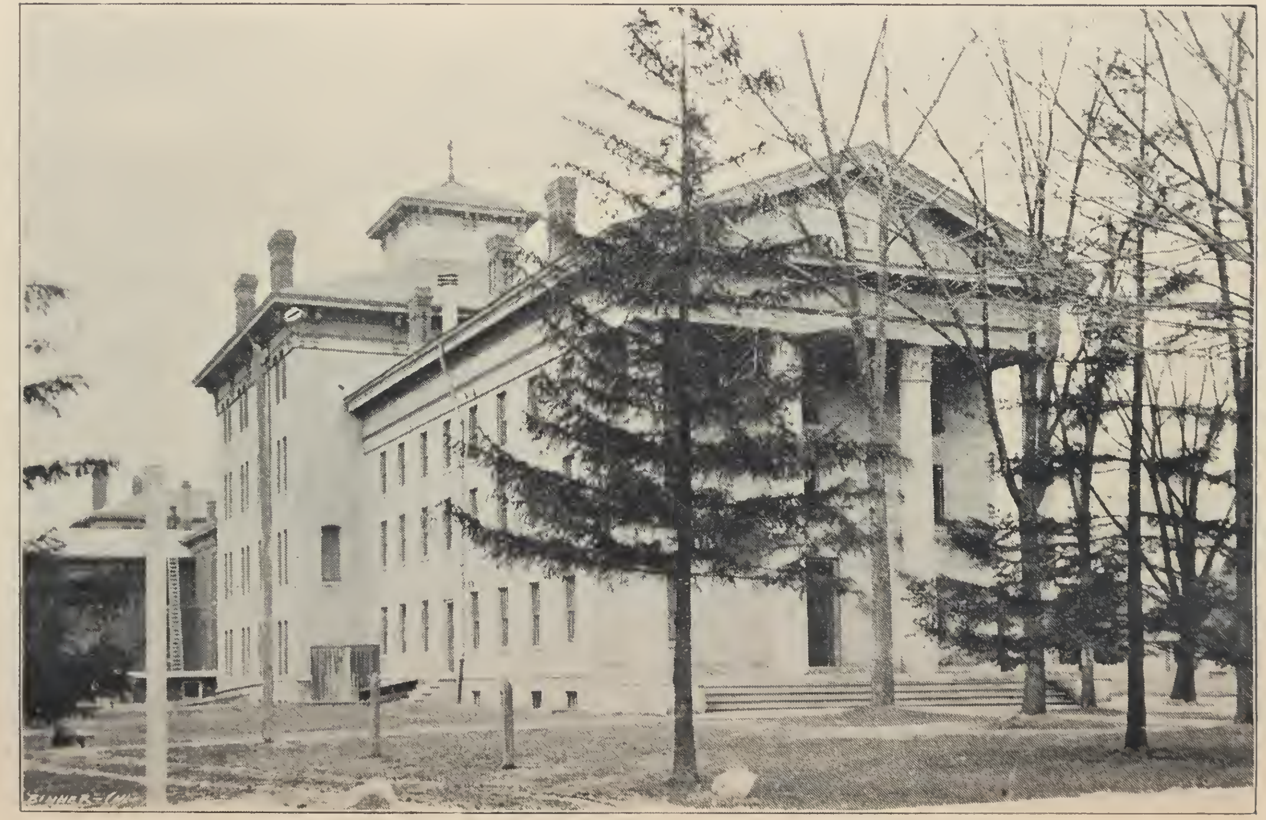
A filling of gold and amalgam in absolute contact, and in the same cavity, produces no appreciable current; the action is limited to the filling alone, just as when the poles of a battery conveying a current are put together. But intolerable effects may arise from fillings of different metals in opposing teeth; as for example, a gold filling in the occlusal surface of a lower right first bicuspid and an amalgam or tin filling in the occlusal surface of the upper right first bicuspid, the fillings so situated that they come in contact when the mouth is closed; thus producing polarization and depolarization each time they are brought in contact and separated, shocks being produced at each depolarization.

"The galvanometer shows that a gold filling can not be so separated from any amalgam filling in any distant part of the mouth, though in the opposite jaw, as to avoid a current, which current if quite feeble does no harm." But we would detect a current in the mouth if the gold filling were not there. Hot or cold drinks cause a change of temperature in different parts of the oral cavity; this produces a current. The breaking down of fluids, secretions, foods, etc., in the mouth also produce like currents. There can be no fixed rule to determine the exact space to observe between fillings. If necessary to fill teeth that occlude, better by far do so with the same metal.

Polarity is not a fixed condition but is determined by the relation of the liquid to the metal; as a filling so situated that one portion comes near the gums, and the other border near the occlusal surface of the crown of the tooth, we find that that part nearest the neck of the tooth is positive, and the part most distant from the neck, negative. Tooth-substance being negative and metals for filling positive, a current is induced, and the acids, etc., in the mouth being decomposed, assist decay by acting in their nascent state; as water, sodium chloride, potassium chloride, ammonia, and sulphuretted hydrogen, which are found in the mouth and readily decomposed by the current. The metals of the salts, etc., go to the negative while the remaining part of the salts go to the positive pole, as H to the — while O goes to the +.

All metals take the same direction when separated from the corrosive elements by electrolysis, and the corrosives such as chlorine, fluorine, and sulphur follow the example of the oxygen, corroding the metal if it is oxidizable and thus finally stopping the current until the oxidized part be removed, when galvanic action begins anew.

It is a well-known fact that nascent chlorine takes hydrogen from almost any compound containing it. It will therefore take hydrogen from water, forming hydrochloric acid at the positive pole. And this is why we so often see the most common varieties of dental caries about the margins of the base metal fillings, this decay being always the result of the action of hydrochloric acid. Again, nascent hydrogen at the negative pole, or gold fill-



THE MEDICAL BUILDING.

ing, takes chlorine from compounds containing it and also overcomes the affinity of a part of nascent chlorine for the positive pole and hydrochloric acid is again formed and we find the same variety of decay about the gold filling.

Ammonia being composed of nitrogen and hydrogen, if present, is also electrolized and hydrogen, being electro-positive, the nitrogen goes to the negative pole and there in its nascent state finds oxygen also nascent; combination takes place, nitric oxide being first formed which in the presence of air and water is rapidly changed to nitric acid. "It is on this principle only that the white variety of dental caries is ever formed as a result of galvanic action within the mouth."

It will be readily seen that we may have these different agents acting in harmony to produce decay, and as they have no effect, or action, with the gold filling, they spend their entire force on the nearest tooth-substance, hence the greatest decay about the gold filling. This, to many operators, proves that base metals are better filling materials than gold, reasoning from the standpoint of preservation of tooth-substance and not appearance and cost.

The quantity of current is in proportion to the amount of surface excited or exposed. Other things being equal, the decomposing power varies inversely as the square root of the distance between the surfaces. For example, two teeth, one filled with gold, the other with amalgam or tin, are situated in the lower right maxilla and one-quarter inch apart. The power of the current is twice as great as it would be if they were one inch apart and this power is increased four fold if they are but one-sixteenth inch apart. Of the substances dissolved, each component part goes to the metal whose electric state is the opposite from its own. Chemical action is the factor to be guarded against, and in filling teeth we unite the material used with a substance which is composed of an alkaline base combined with organic parts of tissue, all bathed in a chemical fluid of no definite composition or stability. Teeth vary in their power of resistance to corroding agents, some being considered not sufficiently dense to be non-conductors of galvanic currents; for example, a tooth filled with gold which admits the least bit of moisture between the filling and the walls of the cavity. The organic matter of the dentine is a conductor and the more so by the additional mixture. Galvanic action is set up between filling and tooth and we have hydrochloric and nitric acid decay, which soon entirely loosens the fillings.

Value of filling materials varies from gold to copper amalgam, varying according to their conductivity and difference in oxidation. Copper amalgam, by hyperoxidation and deoxidation of the copper, refills the decalcified part or structure with a sulphide and thus forms an indestructible compound of the same polarity as the filling, and all galvanic action ceases. Gold combined with tin, or tin alone, and the various grades of amalgam rank between gold at one extreme and copper amalgam at the other, all of which impart to poorly-calcified dentine more or less antiseptic properties, the gold furnishing the least.

A filling composed of gold and tin or of gold and amalgam produces a marked change in the base metal, it being rapidly oxidized, which is unsightly, but makes it the better antiseptic, the galvanic action ceasing as soon as the surface is oxidized. The gold is the — pole and the amalgam or tin the + pole and because of contact, the current is confined to the two metals.

Fillings of base metals and gold may be worn in the same tooth if sufficiently separated or united. The dental tubuli are excellent conductors, and opposite fillings on opposite sides of the tooth are very likely to cause death of the pulp in course of time, or, at least constant trouble. Proximal fillings should be of the same metal, otherwise a few meat fibers, etc., may collect between the teeth and the current is carried from one filling through the dental tubuli to the pulp through bone and tissues of maxilla to, and through, the pulp of the opposite tooth, then through the dental tubuli, to filling, and by the meet fibers, etc., over to, the starting point, thus forming a circuit that in time causes the death of the two teeth so affected. But if it is desirable to insert a gold filling opposite an amalgam and the distance be one-sixteenth inch, or less, the condition of the dentine must be taken into consideration. If preparation of the cavity causes no pain the tooth-substance is usually of a sufficient density and no other preventative is needed than a coat of very thin sandarac varnish. Deep pits are quite objectionable as they bring the gold anchor points often quite near the pulp and cause continued irritation in many instances.

Some authors claim that teeth are rendered more comfort-able, secondary decay less frequent, and fillings are retained longer by using some insulating material between the filling and the entire extent of the walls of the cavity, under the following conditions: when the dentine is sensitive or poorly calcified, and when decalcified tooth-substance is left in the cavity as a capping for the pulp. Substances most used are chloropercha, waxed tissue paper, thin sandarac varnish, oxychloride, oxyphosphates, and dammaar varnish. This latter is by far the best, as it speedily concretes into a very hard resin. The space occupied is very minute, if any, it being taken up in filling the tubuli and scratches made by instruments used in excavating. Otherwise uninsulated gold, amalgam, or tin fillings may cause intense facial neuralgia which is cured only by the removal of the fillings.

In volume IV. of the Missouri Dental Journal we find a comparison of conductivity of materials:

Silver,	100
Gold,	60
Tin,	30
Living dentine,	25
Lightly amalgamated dental alloy [100 alloy to 50 of Hg.].	20
Osteo-plastic,	18
Dead dentine,	15
Hill's Gutta Percha Filling,	13
Heavy amalgamated dental alloy [100 alloy to 100 of Hg.].	10

From this table we can see that either of the materials united to the one below it will cause a current if distance and conditions are favorable. It has also been found that the higher polish a filling has, the current is lessened in proportion, and if the filling is rough the current is correspondingly increased.

So we see that workmanship, filling material, tooth-substance, conditions of the oral cavity, and a knowledge of the laws of galvanic action all have a part in attaining perfection in operative dentistry.

TIN FOIL.

BY STANLEY AMMON FARNUM, '96.

Tin is a comparatively rare white metal harder than lead and very malleable. In ductility and tenacity it is inferior to most of the other malleable metals. Its specific gravity is 1.2 and it melts at about 442°. It may be beaten into leaves one two-thousandths of an inch in thickness, the ordinary tin foil being about one one-thousandth of an inch thick.

About twenty years ago there was considerable dissatisfaction in the use of it. When it came from the manufacturer it looked fairly bright. After being used and exposed to the air it assumed a light brassy color and lost what integrity it formerly possessed. But as it now comes from the manufacturers in sheets of various sizes and thickness it is an easy matter to insert a filling beginning at the base of any cavity and with mallet or hand pressure produce a compact mass that can be cut or filed the same as a gold filling.

Tin coheres, adheres, or welds and makes a solid filling with less malleting than gold requires, for if over-malleted the receiving surface is injured. The extra tough foil now manufactured retains a bright surface and does not lose its good qualities even after considerable exposure. Tin of this kind, well condensed with mallet or hand force, stays up against the sides of the cavity and makes a tight filling, probably expanding and contracting less than gold and gives a surface which will wear for five or ten years, depending upon the size and location of the cavity. It is used considerably and to great advantage in filling many cavities in temporary teeth and also as temporary fillings in the permanent teeth. Children stand it well because it can be done quickly and does not require as much malleting as gold.

Up to the age of fourteen or fifteen we find many teeth which are chalky, and with the fluids of the mouth in such a condition that oxychloride or oxyphosphate do not last long, and for some reason amalgam and gutta-percha soon fail. In these conditions tin is good, even in the incisors, for, as the patient advances in years, the tooth structure generally becomes harder and more dense; then if desirable the filling can be removed and gold inserted instead. It is invaluable when you are limited for time and means, also for filling first molars where we so often find poor calcification and the teeth in a chalky condition. Tin not only arrests decay mechanically, but in frail, chalky structures, acts as an anti-acid element in arresting the electric current set up between the tooth structure and the filling material.

Sometimes the dentine beneath fillings which have been removed is considerably discolored and greatly solidified as compared to its former structure. This is more frequent under tin than gold. In many mouths tin oxidizes, while in others it does not, but retains its clear, gray color. The oxidizing color is very objectionable to some people but this is offset by the fact that the color fills the ends of the tubuli and often arrests further decay. In unhealthy mouths, with the secretions in an abnormal condition, the fillings are very rapidly destroyed by the action of nitric and hydrochloric acid. Such changes may take place so as to destroy them in a short time.

As we get it for filling purposes, it comes in sheets, just as gold, No. 10 foil being the one most used. Either cut this or tear in strips as is usually done and fold into mats or rolls. Tin does not need to be heated as does gold, but should be well malleted together. We have instruments for working this material the same as for gold. They usually have square ends and the serrations are a little coarser than those for gold, although the gold instruments are used sometimes to a good advantage, especially in small cavities, where it is impossible to use the ones intended for the material.

In working tin we should be careful and have absolute dryness using as much care and caution as if we were working gold. We must not think because it is tin it will be all right anyway and hurry it through as soon as possible. No matter what kind of a filling an operator is putting in he should use as much care as in working gold, because a filling poorly done is worse than none at all, for the process of decay is going on underneath it when it looks all right to the eye. An operator should never proceed to introduce a filling until he has all the decay removed, for if he does, his operation is useless, and he is not doing his patient or himself justice.

A cavity which we expect to fill with tin should be nearly the same as for gold, only the retaining forms should be a trifle larger and if pits are used they also should be larger and deeper. In some proximal cavities between the molar teeth where they do not come through the crown you can use tin with considerable advantage without cutting the masticating surface, although it is advisable to cut through the crown in most cases. Great care should be taken to see that the tin is well condensed at the cervical borders in proximal and buccal cavities. The filling is finished nearly the same as gold, first burnishing it and then using corundum stones and in proximal cavities using the disc and emery strips and finally finishing with the burnisher. A filling of this kind should last for many years. Tin is also used considerably in cavities in combination with gold, partly on account of its cheapness, also for its working qualities and adaptability to cervical borders. Some dentists have advocated the rolling of these two metals together, claiming that fillings can be made quicker and are not as subject to thermal changes. Tin used this way will wear somewhat longer than when used alone. I have used tin in connection with gold in proximal cavities mostly, first placing the tin in the cavity and filling it from one-fourth to one-half full and then using gold over this, as tin prevents further decay at the cervical border better than any other metal or combination of metals. It will not do to place too much reliance on the union of the two metals to hold the gold in place but have some retaining form above the tin.

EDITORIAL.

WITH this issue the present editors of the JOURNAL complete their work, and next Fall another Board selected from the student body will conduct the department organ through the troubled sea of journalism. While it has not been all play, still the thorough manner in which each and every member of the Board has performed his share of the labor incident to the publication of each issue, has made the work not only a pleasure but has developed a bond of sympathy and mutual regard between the members of the Board that many years will not efface. Never before has the JOURNAL enjoyed the financial prosperity this year has brought forth, due to the systematic and thorough attention of our Business Manager to the details. The Board wishes to thank the Faculty. students and alumni for their cordial appreciation of our labor, and with the sentiment constantly growing among our alumni of the work and scope of the JOURNAL, future Boards of Control have nothing to fear for the growth and prosperity of our department journal.

IT is with some regret that the JOURNAL notes the attitude our Faculty has taken in regard to base ball playing by the Dental students. While there is undoubtedly more or less risk involved in the participation of the great American game, still the advantage reaped from improved physique and consequent brain vigor, far overbalances the chances of loss of mobility of the fingers—the only actual hazard of the game. We, as a department, have gained an enviable position in the athletics of the University, and it can no longer be said of the Dental students that they take no interest in the various athletic games and meets of the campus. The winning of the inter-class championship by the Medical students would be an additional stimulus for our students to enter the field early next spring, but the action of the Faculty will again place our department in the oblivion sure to follow non-participation in the sports and games so dear to the college man.

THE movement on foot among the private dental colleges to force up the annual fees to a minimum of $100, under threat of expulsion from the National Association of Dental College Faculties, is hardly a display of generosity that one is apt to expect from the in-most-part-ethical gentlemen in charge of these private institutions. While the JOURNAL deplores the fact that our department is not self-supporting, and is heartily in favor of an increase in the amount of the annual fees to meet the deficiency, this plan of coercion on the part of the private schools is entirely out of place and, in the face of the facts, looks to be a thrust at the prosperity and growth of our dental school.

A STEP in the right direction is the establishment by the Board of Regents of a summer school of dentistry. This will not only permit students to make up work in the mechanical part of their art, but will enable practitioners to perfect themselves in the more modern crown and bridge work and in porcelain work. The course, which is as yet in its infancy, is bound to be a success.

DENTAL SOCIETY MEETINGS.

THE annual meeting of the Michigan State Dental Association was held in Grand Rapids, June 10, 11 and 12. Following is the program:

WEDNESDAY, JUNE 10.

2:00 P. M.—ORGANIZATION.

3:00 P. M.—PAPER.
"Absorption of the Roots of Temporary Teeth."
By A. W. HAIDLE, D. D. S., Ann Arbor.
Discussion opened by N. S. HOFF, D. D. S., Ann Arbor.

4:30 P. M.—PAPER.
"Points of Interest in the Care of Children's Teeth."
By B. J. DEVRIES, D. D. S., Holland.
Discussion opened by E. T. LOEFFLER, D. D. S., Saginaw.

7:30 P. M.—PAPER.
"What Should the Dentist Do to Save the Teeth?"
By N. S. HOFF, D. D. S.
Discussion by DRS. J. TAFT, JAMES CLELAND, W. H. JACKSON, E. C. MOORE and GEO. L. FIELD.

THURSDAY, JUNE 11.

9:00 A. M.—PAPER.
"Examination of the Teeth Preparatory to Treatment or Filling."
By J. TAFT, M. D., D. D. S., Ann Arbor.
Discussion opened by E. S. HOLMES, D. D. S., Grand Rapids.

10:30 A. M.—PAPER.
"The Fate of Associations," by J. C. WALTON, D. D. S., Howell.
Discussion opened by A. S. METCALF, D. D. S., Battle Creek.

1:30 P. M.—CLINICS.
"New Process of Swedging Plates and Crowns."
Dr. J. C. PARKER, Grand Rapids.

"Adjusting Facing to Broken Bridge without Removing Piece from the Mouth." F. C. SIZELAN, D. D. S., Muskegon.

"The Use of Nitrous Oxide in Dental Operations."
E. R. JACKSON, D. D. S., Grand Rapids.

"Bleaching of Teeth by Use of Pyrozone." Dr. H. W. RAY, St. Joseph.
"Plate Work." Dr. J. F. Perry, Lawton.

4:30 P. M.—BUSINESS MEETING.
Election of Officers.

7:30 P. M.
"Personal Observation of the Development of Dentistry and Dental Legislation in Michigan."
By G. E. CORBIN, M. D., D. D. S., St. Johns.

"Dental Legislation." A. W. DIACK, D. D. S., Detroit.
Discussion General.

FRIDAY, JUNE 12.

9:00 A. M.

"Dental Cataphoresis." By R. W. MORSE, D. D. S., Lansing.
Discussion opened by J. A. WHITE, D. D. S., Saginaw.

10:00 A. M.

"Bleaching Discolored Tooth Structures; Method and Agents Employed." By H. T. HARVEY, D. D. S., Battle Creek.
Discussion opened by W. A. Dorland, D. D. S., Grand Rapids.

11:00 A. M.

"Then and Now." J. A. ROBINSON, Grand Rapids.
Discussion General.

1:30 P. M.—CLINICS.

"Gold and Platinum Fillings."
By F. W. TEMPLE, D. D. S., Grand Rapids.

"Continuous Gum Work." By L. D. WOOD, D. D. S., Grand Rapids.

"Obtunding Sensitive Dentine and Treating Putrescent Pulps."
By F. A. KOTTS, D. D. S., Toledo, Ohio.

"Filling as it Was Done Fifty Years Ago."
By Dr. I. DOUGLASS, Romeo.

"Dental Cataphoresis," by R. W. MORSE, D. D. S., Lansing.

"The Condit System," by BURT ABEL, D. D. S., Albion.

7:00 P. M.—BANQUET.—At the Lakeside Club.

J. WARD HOUSE, President.
B. H. LEE, Secretary.

A MEETING of the Inter-State Dental Association was held at Excelsior Springs, Missouri, June 23, 24, 25 and 26.

The 18th Annual Meeting of the Indiana State Dental Association was held at Indianapolis in the new Indiana Dental College Building, on June 30th.

THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE twelfth annual session will be held at Saratoga Springs, N. Y., commencing 10 o'clock, A. M., Monday, August 2d, and continue in session during the proceedings of the American Dental Association.

It is earnestly requested that all State and Territorial Boards of Dental Examiners will send delegates.

CHAS. A. MEEKER, Sec'y and Treas.,
29 Fulton Street, Newark, N. J.

DENTAL COLLEGE FEES.

There is a movement on foot among dental colleges to force the annual fees paid by students up to a mimimum of $100. The movement began among private institutions. The University of Michigan charges $45 a year.

It is expected that all institutions that do not conform to the new rule will be excluded from the national association of dental college faculties, and that the national board of examiners and many state boards will discriminate against institutions not represented in the national association.

So far as this state is concerned, the board of examiners are governed by a statutory provision which makes the dental college requirements of the university their standard for admitting applicants to practice.

A moderate raise, however, is regarded as almost of necessity. Some people here desire to make all professional departments entirely self-supporting, a distinction at present enjoyed solely by the law school. The weight of opinion, however, favors low fees, and in keeping this institution in all departments, "a poor man's university."

Dean J. Taft and Secretary N. S. Hoff will represent this dental college in the national convention of the dental faculties. It is stated that the regents have directed them to use their influence against the proposed change.

NOTICES.

Copies of certain numbers of the Journal are wanted by the library. Anyone having copies of the following numbers will confer a great favor, and will be well paid, if they will forward them: Vol. I, No. II; Vol. II, No. I; Vol. II, No. IV; Vol. III, No. I; Vol. III, No. IV; Vol. IV, No. I; Vol. IV, No. IV. Please address,

Dr. A. W. Haidle,
Ann Arbor, Michigan.

Dentists having extracted teeth on hand will be doing the college a great service if they will forward them C. O. D. to Dr. L. P. Hall, Ann Arbor, Michigan.

ALUMNI NOTES.

Dr. F. F. Scott, '95, expects to locate this fall in Washington, D. C.

On June 1, Dr. A. Ball, '95, of Flushing, Michigan, was seen about the college.

Dr. Frank D. Wilson, '81, of Omaha, Nebraska, has removed to Atlanta, Georgia.

Dr. A. H. Kessler, '94, spent Commencement week in Ann Arbor and Ypsilanti.

Dr. C. T. Whinery, '94, of Toledo, called on friends and visited about the college on May 13.

Dr. R. E. Drake, '88, of Negaunee, Michigan, spent Commencement week in this city with friends.

Dr. Douglas Anderson, '95, has associated himself in practice with his brother Albert E., at Maidstone, England.

Dr. F. W. Blake, '94, of Alpena, visited the college May 12 and 13. Dr. Blake is associated in his practice with Dr. F. A. Carr.

Dr. M. J. Moyer, '94, of Dundee, Michigan, has sold his practice to Eddie W. Brown, '96, and intends to locate in the west.

A nine-pound boy was born to Doctor and Mrs. G. E. Tribby, '92, of Mentor, Ohio, on May 13. Congratulations are in order.

Dr. W. G. Lentz, '95, of Mentor, Minnesota, has removed to Prescott, Arizona. Charley Cleaver, '96, will take Dr. Lentz' practice in charge.

The news comes to us that Dr. J. H. Stromier, '95, of Glasgow, Scotland, has successfully passed his examinations in that country for the L. D. S. degree.

We learn that Dr. Harry B. Respinger, '95, of Basel, Switzerland, has established a polyclinic. Poor patients are seen free of charge each morning from eight to nine o'clock, Sundays excepted. This action of Dr. Respinger is certainly commendable.

A recent letter from Dr. F. E. Dodge, '95, of Vienna, Austria, affirms that that city is one of the finest in the world, not only as a residence, but as one in which to practice dentistry.

At the last meeting of the Detroit Dental Society, the following officers were elected for the ensuing year: Drs. J. L. Young, president; W. C. Herbert, '89, vice-president; J. M. Thompson, secretary; and Will Cleland, '84, treasurer.

At the regular meeting of the Alumni Association held on June 24, the following officers were chosen: Dr. L. P. Hall, president; Dr. Ostrander-Adams, Toledo, vice-president and Dr. A. W. Haidle, secretary and treasurer. The members of the class of '96 were elected to membership upon signing the constitution and upon payment of the membership fee of fifty cents.

Among the loyal alumni who returned to attend the meeting of the Alumni Association and the Commencement Exercises, were Mrs. Dr. Ostrander-Adams, of Toledo, Ohio, and Mrs. Dr. Miller-Gedney, of Winnebago, Minnesota, both of '94. Dr. Miller-Gedney was accompanied by her three-months-old son and will remain in Ann Arbor until September visiting with her mother.

At the meeting of the Michigan State Dental Association the following officers were elected: Dr. A. W. Diack, of Detroit, president; Dr. E. T. Loeffler, of Saginaw, 1st vice-president; Dr. H. T. Harvey, of Battle Creek, 2d vice-president; Dr. H. C. Raymond, of Detroit, secretary; Dr. Geo. H. Mosher, of Jackson, treasurer, and Dr. J. L. Sweetman, of Manistee, member of Board of Control.

A SUMMER SCHOOL.

At a recent meeting of the Faculty of our department it was decided to establish a Summer School in dentistry in connection with that of the other departments in the University. Being a new departure it may be regarded in the light of an experiment. From present indications it is expected that from eight to twelve students will be enrolled, all of them at present students in the department.

For this year, at least, no instruction will be given but that of a mechanical nature, though it is hoped that if the venture proves successful, the scope of the work may be enlarged upon in the future.

We give, herewith, a schedule of the courses as arranged, with the fees for each: *a*. For full term of six weeks—instruction in any or all desired branches of mechanical technique—matriculation fee, five dollars; tuition fee, twenty-five dollars. *b*. For instruction in continuous gum and other porcelain work matriculation fee, three dollars; tuition fee fifteen dollars. *c*. For instruction in the making of regulating appliances—matriculation fee, three dollars; tuition fee, fifteen dollars. *d*. For instruction in crown and bridge-work, and in plate-work—matriculation fee, three dollars; tuition fee, fifteen dollars.

These courses may be taken in connection with others that are open in the scientific and literary departments of the University. It is hoped that another year may see some of our older alumni and practitioners interested in this undertaking. Dr. A. W. Haidle will give the instruction, though the whole will be under the supervision of Dr. N. S. Hoff. Credit will be given for all work done, and will be recorded on the secretary's books.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

At the last meeting of the State Board of Dental Examiners, held in Saginaw, on May 5, 6, 7, 8, sixteen applicants presented themselves for examination, of which number the following passed:

NAME.	COLLEGE.	RESIDENCE.
C. L. Norton,	No college,	Adrian.
N. G. Bowbeer,	Univ. of Maryland,	Wyandotte.
A. S. Atkinson,	Penn. Dental College,	Detroit.
T. C. Lunger,	Penn. Dental College,	Detroit.
D. E. Parmelee,	No college,	Lansing.
L. D. Mills,	No college,	Coopersville.
J. S. Watts,	No college,	Brown City.
H. Darling,	Chicago Coll. Dent. Surg.,	Sault Ste. Marie.
F. H. Walters,	Indiana Dental College,	Maple Rapids.
W. F. Alton,	No college,	Bay City.
G. H. Sweet,	Phila. Dental College,	Detroit.

The next meeting of the Board will be held in Detroit, October 20, at 10 o'clock A. M.

Frank O. Gilbert, D. D. S., Sec.,
Bay City, Michigan.

REPORT OF PROSTHETIC CLINIC FOR 1895-6.

Full upper rubber plates	16
Full lower rubber plates	7
Partial rubber plates	16
Repair rubber plates	17
Regulating cases	5
Bridges	4
Bridges, repair	1
Porcelain crowns	3
Gold crowns	41
Richmond crowns	1
Logan crowns	1
Aluminum plates	11
Watt's metal plates	15
Watt's metal plates, reset	1
Watt's metal plates, repair	1
Silver plates	14
Silver plates, repair	2
Total number	156

OPERATIVE CLINIC FOR 1895-6.

Bridges	2
Bridges, repair	4
Caps, gold	2
Crowns, gold	31
Crowns, porcelain	2
Crowns, Logan	82
Crowns, Logan, banded	3
Fillings, gold	6185
Fillings, plastic	1280
Treatments	1255
Extractions	468
Cleanings	654
Number patients	8620
Number operations	9968

LIST OF GRADUATES OF THE DENTAL DEPARTMENT OF THE UNIVERSITY OF MICHIGAN FOR THE COLLEGE YEAR '95–'96.

NAME.	RESIDENCE.
Elmer Harry Argetsinger,	*Mapleton, Minn.*
Frank Charles Arnold,	*Ann Arbor.*
Jay Cyrus Arnold,	*Ann Arbor.*
Frank Miller Bacon,	*St. Clair.*
Clarence Harvey Bailey,	*Detroit.*
John Wesley Bass,	*Sullivan, Ind.*
Eddie W. Brown,	*Nashville.*
Edward Dancey Brown,	*Brownsville, Ont.*
Robert Reynolds Buckthorpe,	*Jacksonville, Ill.*
Harry Sizer Buell,	*Menominee.*
George Franklin Burke,	*Ann Arbor.*
Willis Hezekiah Buttolph,	*Pontiac.*
Jessie Estelle Castle,	*Battle Creek.*
James Nelson Clarke,	*Flushing.*
Charles William Cleaver,	*Ann Arbor.*
Jonathan Peter Collett, B. S., *National Normal Univ.*.	*Ansonia, O.*
Irving William Copeland,	*Paw Paw.*
Ernest Frank Day, L. D. S.,	*London, England.*
George Leonard David,	*Aledo, Ill.*
Edwin Victor Deans,	*Ox Bow, N. Y.*
Charles Alphonsus Devlin,	*Vallejo, Cal.*
Stanford James Farnum,	*Cassopolis.*
Stanley Ammon Farnum,	*Cassopolis.*
Charles Frederick Fitch,	*Jamestown, N. Y.*
Fred Anson Graham,	*Ann Arbor.*
Fred Joseph Hale,	*Ypsilanti.*
Hector Hillman,	*Ann Arbor.*
Cleveland Artley Houghton,	*Theresa, N. Y.*
Burton Truman Hunt,	*Antwerp, N. Y.*
Charles Lee Kemery,	*Flint.*
Vernor Jay Lathrop,	*Morgan.*
John Adolph Lentz, LL. B.,	*Ann Arbor.*
Howard Joseph Livingston,	*Denver, Col.*
Frank Erland Logan,	*Pickering, Ont.*
James White Lyons,	*Mt. Pleasant.*
Thomas Steven Mann,	*Ann Arbor.*
Samuel Stephen Mummery,	*Ann Arbor.*
James Henry O'Toole,	*Ann Arbor.*
Charles Augustus Phillips,	*Terre Haute, Ind.*
Ross Porter,	*West Sunbury, Pa.*
Frank Glenn Powers,	*Scotts.*

Herman Prinz,	*Toledo, O.*
Charles Alfred Quackenbush,	*Ludington.*
James Robins,	*Warminster, Ont.*
William Howard Roper,	*Reedsburg, Wis.*
Thomas Francis Sheridan,	*Flushing.*
Charles Levant Sherwood,	*Titusville, Pa.*
Charles Eyster Slagle,	*Oregon, Ill.*
Albert Lyman Smith,	*Orange.*
William Joseph Stapish,	*Chelsea.*
Morley Punchun Templar,	*Woodstock, Ont.*
Wilber Townsend,	*Albia, Ia.*
Alburtus Van Ark,	*Holland.*
Charles Alfred Wehe,	*Topeka, Kan.*
Ralph Levant Williams,	*East Randolph, N. Y.*
Raymond Lester Williams,	*Beaver Dam, Wis.*
Raymond Parker Winning,	*Saginaw, East Side.*
Robert Millard Woodin,	*Ann Arbor.*
George Herbert Wooton,	*Hastings.*
John Alexander Wooton,	*Hastings.*
Percy Bennett Wright,	*Jackson.*

DEPARTMENT NOTES.

H. D. Watson, '97, will spend the summer with Dr. J. W. House at Grand Rapids.

G. W. Randall, '97, will assist Doctor Randall of Port Huron during the summer.

It is understood that several members of '97 will enter Chicago colleges next year.

E. J. Beistle, '97, will pass the vacation months in the office of Dr. Strytser at Buchanan, Michigan.

E. J. Anderson, '98, will be in Ann Arbor during the summer.

W. H. Johnson, '97, will be in Alliance, Ohio, during the vacation.

Miss June A. Burr, '97, will spend the summer at her home in Bangor, Maine.

F. W. Joslin, '97, expects to go on a yachting excursion during the hot months.

A. H. Kinmond, '98, will probably play ball with the Battle Creek team this summer.

It seems that J. N. Vodrey, '97, will spend his entire summer vacation at Deerfield, Michigan.

Miss Dessie B. Robertson, '97, will spend the vacation at her old home, McConnelsville, Ohio.

At the last meeting of the Board of Regents the salary of Dr. A. W. Haidle was raised to $700.00.

L. R. Slawson, '97, will work in the office of his brother, E. D. Slawson, '92, at Bay City during the vacation.

It is rumored that a number of the members of '97 and '98 will be asked by the Faculty to not return next year.

Professors J. Taft, N. S. Hoff and L. P. Hall attended the meeting of the Michigan State Dental Association at Grand Rapids on June 10, 11 and 12.

Geo. F. Burke, '96, will spend the summer months in England, which country he expects to tour on a bicycle. On his return he will locate in Detroit.

F. E. Logan, '96, was appointed by the Board of Regents to the position of Assistant to the professor of Operative Dentistry. It is as yet doubtful if Mr. Logan will accept the position.

It is said that Miss Bertha Woodin and Miss Edith Phillips, '98, will not return to finish the course. It is understood that they do not like dentistry as well as they fancied they would.

Dr. L. E. Custer, of Dayton, Ohio, gave a most interesting clinic and demonstration of his electrical appliance for cataphoresis before the senior class on June 12. Ralph L. Williams, '96, was the patient operated upon and a mesial cavity in the second right upper bi-cuspid was excavated with absolute absence of pain. The current was allowed to pass through the tooth for twelve minutes, and it took less than one minute to turn off all the current. Several classmates added their testimony to that of Mr. Williams, that his teeth were, under ordinary conditions, hypersensitive, yet he experienced no pain whatever during the operation. Dr. Custer certainly has the best appliance of the kind yet seen. A mercury bath increases or decreases the strength of the current as it is allowed to flow in or out of a glass cylinder in which a coil of wire is obliquely suspended. The whole device is as simple as it is perfect and reflects much credit on its already renowned inventor.

J. C. Blair, E. E. Bubb, F. R. Fletcher, G. S. Hadley, all of '97, and A. Bröcking, A. Fellner, C. Lebert, J. B. Stewart, of '98 and R. M. Woodin, '96, will take up special lines of work in the Summer School.

If reports prove true, several members of '97 and '98 will have to enter as '98 and '99 students, respectively, if they wish to return in October. This is because of the poor character of the work done during the year just closed.

On August 5, J. C. Blair, '97, will leave with his father for an extended western trip, after having completed a course of study in the Summer School. Denver, Colorado Springs and Salt Lake City will be the objective points.

A. J. Reed, W. R. Purmort and S. W. Hussey, all of '97, will spend the summer at the Les Cheneaux Club, near Mackinac, where they hold responsible positions, Mr. Reed being clerk of the house. We shall be apt to hear of some monster catches of fish when they return in October.

So far as known the members of the class of '96 will locate as follows:

F. F. Sheridan, Duluth, Minnesota.
C. L. Sherwood, Titusville, Pennsylvania.
C. F. Fitch, Jamestown, N. Y. in partnership with Dr. West.
C. H. Bailey, 986 14th Ave., Detroit.
W. J. Stapish, Ridgeville, Indiana.
I. W. Copeland, Ashland, Ohio.
E. D. Brown, Dundee, Michigan.
G. H. Wooton, Oberlin, Ohio.
P. B. Wright, Cottage Grove Ave. and 47th St., Chicago.
R. R. Buckthorpe, Jacksonville, Illinois.
C. A. Devlin, Vallejo, California.
C. A. Phillips, Terre Haute, Indiana.
W. Townsend, El Paso, Texas.
W. H. Buttolph, Canton, Ohio.
G. F. Burke, Detroit.
F. C. Arnold, Charlotte, Michigan.
H. Prinz, St. Louis, Missouri.
S. A. and S. J. Farnum, Cassopolis, Michigan.
E. V. Deans, Potsdam, New York.
C. A. Wehe, Topeka, Kansas.

T. S. Mann, St. Johns, Michigan.
C. L. Kemery, Pittsburgh, Pennsylvania.
H. J. Livingston, Denver, Colorado.
F. J. Hale, Hudson, Michigan.
B. T. Hunt, Lowville, New York.
E. H. Argetsinger, Winona, Minnesota.
Ralph L. Williams, Pittsburgh, Pennsylvania.
F. M. Bacon, Port Huron, Michigan.
J. W. Bass, Sullivan, Indiana.
H. S. Buell, Menominee, Michigan.
J. P. Collett, Celima, Ohio.
H. Hillman, Plymouth, Michigan.
V. J. Lathrop, Lorain, Ohio.
J. W. Lyons, Mt. Pleasant, Michigan.
S. S. Mummery, Fenton, Michigan.
C. A. Quackenbush, Ludington, Michigan.
C. L. Cleaver, Mentor, Minnesota.

Seniors-

We solicit your patronage, now and in the future. We keep in touch with the times and supply the latest and best goods at manufacturers' prices. Our large stock enables us to fill orders promptly and without substitution. Talk with us about your office outfit and get the benefit of our quarter century of experience.

Juniors-

Since the opening of the Dental Department, we have made a study of the Dental Student's requirements, and we guarantee our outfits to please the professors in charge.

While yet a Junior, talk with us about your Senior outfit and get a few pointers. See our Student's Box, specially designed for the needs of the U. of M. Senior. Post up on the quality, styles and prices of the articles you will use.

Call for the *Ohio Journal*, which we give you each month with our compliments.

Freshmen.

Our location is permanent and handy. That, and the well-known fact that we carry a large stock, makes the purchase and exchange of goods convenient. Make a convenience of us now, and don't forget us when you want your future outfits.

Call for the *Ohio Journal* each month. It's free to you.

THE RANSOM & RANDOLPH CO.,
DENTAL DEPOT,
Toledo, Ohio.